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A PLEA FOR EFFICIENCY AND ECONOMY IN THE MAINTENANCE AND OPERATION OF PRIVATE AGENCIES WORKING FOR THE CONSERVATION AND PROMOTION OF PUBLIC HEALTH.

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Washington, D. C.

Presidential Address, American Public Health Association, Jacksonville, Fla., November 30, 1914.

The constitution of the American Public Health Association requires that the president give at the annual convention an address on some subject related to public hygiene. Fortunately, these subjects are so numerous that a speaker can have no difficulty in finding something to discuss within the prescribed limits. The difficulty begins only when he starts his search for that one subject best suited for presentation on the particular occasion before him. Here lie the fields of bacteriology, from which he may choose. Here, the fields of physiology tempt him with problems for presentation to his audience. Here are the problems of chemistry; here, of engineering; here, of vital statistics; and sociology offers its living issues, never before so acute and pressing as today. By all these fields I have resolutely passed, leaving them for consideration in the meetings of the general Association and of the several sections by those who are better able to discuss them and who, I hope, may be able to resolve their knowledge into reliable guides for human conduct. My theme is a simpler and more homely one than the problems of science by which I have passed, but one upon which, in so far as the welfare and the duty of the Association are concerned, all else depends; for efficiency and economy in the discharge of the functions it has assumed constitute the only foundation upon which the Association can base any claim for public sympathy and support, and I purpose discussing in the time allotted me this evening some of the elements that determine the efficiency or inefficiency, the economy or extravagance, of this and other organizations that as volunteers have entered upon the field of public health activity. An inquiry of this kind, however, to be of value, must be of more than merely historical interest. It must form the basis of constructive criticism. It must point out the way to greater and greater efficiency, and increasing economy, until the maximum of popular sympathy and support be obtained for all public health activities.

Public health is nothing more than the aggregate of the health of the individuals of which the public is made up, and the protection and promotion of the public health is merely the protection and promotion of the health of the individual. Up to a certain point each individual can protect himself, but beyond this he cannot go. Ignorance on his part, lack of the necessary money, and inability to control the conduct of those about him, all stand in the way and make assistance necessary. Clearly the rendering of such assistance is a function of the government; for the government imposes many restrictions upon the conduct of the individual that limit his ability to protect and promote his own health, however necessary they may be for other reasons. It claims in the way of taxes a certain part of his earnings. It may in time of peace require his services as a juror and as a peace officer, and in time of war it may demand even that he lay down his life in its defense. On the face of things it might seem that the machinery of the government having been organized and established with the authority, the power, and the duty of protecting and promoting the health of the people, private agencies have no proper function to perform with respect to the matter. We have not yet, however, arrived at that happy state in which the government does everything that logically and equitably it should do, and in no other field of human welfare is the inadequacy of the discharge of government functions so marked as in the field of public health. And in so far as the individual cannot help himself and the government will not help him, it is incumbent upon everyone interested in human welfare to do whatever may be possible to relieve the situation, and all the while to endeavor to persuade the government to do its duty with respect to the matter. Until the government does recognize its obligations and undertake to discharge them, organized private effort will be necessary.

Since there is no public health separate and distinct from the aggregate of the private health of the community, the organization that would better public health in any respect whatsoever must reach the individual and induce him to act; it may be to induce him to do some particular thing to protect his own health or to protect the health of his neighbors, or it may be to induce him to raise his voice to compel the government to give to the protection and promotion of the health of the people the same interest and support that it gives to merely material things. But whether it be one thing or the other, the problem is the same: How can the individual be most effectively and economically reached and induced to act? And the obstacles in the way of the solution of this problem are identical. Ignorance, poverty, and prejudice on the part of the persons to be reached; lack of money and of workers on the part of the organizations engaged in the propaganda.

Ignorance, prejudice, lack of workers, and lack of money interfere as much with our activities against mental disease as with our campaign against the forces responsible for an undue infant mortality. The difficulty of bringing home to the individual the facts we know concerning personal hygiene stands as much in the way of the prevention of tuberculosis as in the way of the prevention of social diseases. The problem of inducing the public to protect its water supplies is the same as the problem of interesting the public in an active way in school hygiene. And that the facts to be taught and the action that the individual is to be persuaded to take differ in some respects according to the disease to be prevented does not materially alter the problem. "Do not spit in public places" is as good advice for the prevention of diphtheria as for the prevention of tuberculosis. Tuberculosis has no patent upon the need of life in the open air, for such life as undoubtedly conduces to the prevention of pneumonia as to the prevention of the white plague itself. And prevention of infant mortality is not an effort to prevent any one disease or class of diseases but aims to limit all conditions inimical to infant life, and these are to a very large measure the very same conditions that are inimical to all life. Every private agency engaged in public health is, therefore, confronted by substantially the same problem, and each has an equal interest in finding out how it may be most efficiently and economically solved. Manifestly, then, these organizations should at the very least join in an effort to standardize their methods of work, so that each may have the benefit of the knowledge and experience of all others; and in so far as such knowledge and experience indicate that there should be coördination or consolidation of the work of such organization, such coördination or consolidation should be effected.

The American Public Health Association, the oldest of these organizations, was organized in 1872, for the advancement not of any one branch of sanitary science but of sanitary science generally. For more than thirty years it alone held the field of private activity in the field of public health work, thriving sometimes more vigorously and sometimes less, as popular interest varied one way or the other. But about 1904, with the diffusion of the knowledge that tuberculosis was preventable, there appeared a new idea about which public opinion and popular action in relation to public health might develop. Had the American Public Health Association been an active factor in molding public opinion at that time, it would undoubtedly have been the agency through which the resources of the country would have been organized for the suppression of the disease named; but the

Association was apparently lacking in vitality when the need for action arose. Its membership was small. Money was scarce. The Association had no organ through which it might communicate with the people and make its influence felt. The result was that the movement for the suppression of tuberculosis rallied about a standard outside of the Association, and in 1904 the National Association for the Study and Prevention of Tuberculosis was formed. The time was ripe for such a movement, and there was no difficulty in enlisting under the banner of the double cross many who were interested; some because of personal experience with tuberculosis, and some because of interest in the health movement generally.

The movement thus inaugurated for the establishment of volunteer bodies, independent of the American Public Health Association and not correlated with it, for work in special fields of endeavor looking toward the conservation and promotion of the public health, was carried further along in 1907, when the American School Hygiene Association was formed, and again in 1910, when the American Association for the Study and Prevention of Infant Mortality came into existence. Other organizations have since sprung up, but it is impossible here to go at length into the circumstances that lead to their formation. That some of these organizations have served useful purposes, no one will deny; and if the question were merely, is the public health protected by this array of private agencies, the answer would undoubtedly be that it has contributed materially toward that end and is still doing so. But the question is something more, for we must consider not only whether these private agencies afford protection to the public health, but also whether they afford the maximum protection that their resources, contributed by the public, entitle the public to expect. But if our study of the situation is to be constructive, as we agreed at the outset it should be, we must consider first what possibilities, other than the existing system of independent units, are open for the organization of our volunteer public health agencies; and we find, first, the possibility of a mere coördination of such agencies, and, second, the possibility of a single health organization to cover all fields of public health activity.

That coördination of the work of our public health agencies would be productive of results better than are now attained seems certain. There would be less overlapping of effort and of appeals for funds, and each organization would profit by the experience of all others. But there would still be the same multiplicity of officers and employees, engaged in the same kinds of administrative work; possibly the same number of more or less expensive offices; the same division of resources; and the same weakening of strength and authority in the appeals to the public for support and for action. Only as a step toward consolidation does any effort to coördinate the work of special organizations seem worth while, unless there is some insuperable obstacle in the way of consolidation. Whether there is any such obstacle must appear when we consider, as we shall now proceed to do, the advantages and the disadvantages of a single organization as compared with those incident to the present multiplicity of agencies, each operating in a special field of endeavor.

The organization and work of any volunteer private agency, whether general or special in its scope, engaged in work looking toward the conservation and promotion of public health, involves several distinct activities: First, appeals for money and volunteer service. Second, the organization, supervision, and control of the working forces of the association, whether paid or volunteer. Third, the rendering of service to the public, for which the association or society exists.

The argument most frequently advanced in favor of the maintenance of a considerable number of special societies is that certain individuals can be reached by appeals on behalf of one form of public health work who have no interest in any other, and that special societies can best reach such individuals. The father who has lost a son from tuberculosis will respond more readily to an appeal for money for the prevention of tuberculosis than to any other. The wife who has seen her husband sink from a position of social and intellectual eminence until his only refuge and safety lay within the walls of an asylum for the insane will contribute more readily to a fund for the prevention of mental disease than to a fund for the saving of babies. The mother whose baby died in infancy will be most strongly appealed to on behalf of infant welfare. That the premise is true cannot be denied, but it cannot be conceded that the conclusion follows. A single public health organization made up for the prosecution of public health work generally can make appeals for funds and services wherewith to carry on its activities in any particular field of service just as well as can the organization whose activity is limited to that field; and by any proper system of accounts, or by a system of trust funds if necessary, it can assure the donor that what is given for a particular purpose will be applied to no other.

Moreover, while the appeal of the special society must be based upon interest on the part of the prospective donor in some particular disease, the appeal of the general society can be based upon other interests that may be even stronger. The society having the broader scope can appeal to the people of a state for money and service wherewith to carry on a campaign, either general or special, within the confines of the state, and similar appeals can be made to the people of a county, or of a city or town; and local sympathy and pride may be relied upon to open the pocketbook. The general society can appeal for support to the members of any particular religious denomination, or of any fraternal order, or of any labor organization, and so on, with full confidence that the bonds of fraternal sympathy will lead to substantial response. Or combinations of local pride with fraternal interest, even combined with an appeal to interest in the prevention of some particular disease, can be made by the general society. And in this way the confusion arising out of many appeals, from many sources, for many purposes, may be avoided.

Another advantage of appeals based upon something more then mere interest in some one malady lies in the ease with which the interested group can be reached. To find the persons in any community, large or small, who are interested in the prevention of one disease rather than another and who can be reached only through an appeal to that special interest, we must scour the entire community. And in the end, except in so far as relates to the interested persons actually found and appealed to, the entire search goes for nothing. A society existing for the prevention of blindness alone may discover some one vitally interested in the prevention of cancer and appeal to him in vain; but so long as the society for the prevention of cancer is not put into touch with the person thus unsuccessfully appealed to, the labor that located that particular person and uncovered his particular interest has been lost. Were such an appeal made by a general society interested in the prevention of cancer as well as in the prevention of blindness, money available for the prevention of cancer might be readily forthcoming, even though the original appeal had been for money for the support of a campaign against blindness. What is true with respect to these two conditions is true also with respect to others; these have been cited merely for purpose of illustration.

Coming now to another feature of the work of private agencies engaged in public health work, with respect to which comparison must be made of the relative advantages of one general organization as compared with many special societies, we have the matter of administration. One of the most serious obstacles to the success of the special society lies in the very matter of administration and administrative expenses. The work of the central office absorbs so much of the money and energy of the organization that field work is practically impossible. Overhead charges are out of all proportion to the work accomplished and even to the work undertaken. Until means are found whereby the income of these small organizations can be very largely increased, or else some method devised whereby the proportion of the entire income spent for office expenses largely reduced, this condition must continue and effective field work will be impossible. How slight the chances are of any considerable increase in the incomes of these special societies is a matter of common knowledge. Efforts toward that end have been unproductive of results up to the present time, and there is no reason to look for better success in the future. The only recourse seems to be the adoption of some method whereby the proportion of the income spent for office expenses will be reduced, and this seems impossible so long as the special society remains its present basis. Offices must be rented; secretaries and clerical assistants must be paid; and the cost of stationery, conventions, and so on, continue; and practically nothing remains for field work.

Compare this condition with the condition that would exist if the work of all special societies were organized and supervised under the direction and control of a single central body. One office, one secretary, one group of office assistants, and one budget for all incidental expenses, might be relied upon to serve the entire organization, releasing for field work some of the secretaries and clerks now employed, whose travelling expenses might be paid from the money then no longer needed for the rent of a multiplicity of offices; or branch offices might be established, if desired, without increasing the present budget. One health journal for the entire membership of the combined organizations would have a circulation in excess of any likely to be obtained by the official organ of any special society, and the economy of production and the increased income from advertising that come with an increasing circulation would permit the employment of an editorial staff to devote itself entirely to the service of the journal, with possibly the publication of a health journal along popular lines. With better organization of the central office that larger resources would permit, with a capable field corps to maintain a propaganda for health throughout the county, and with an aggressive official journal, supplemented it may be with a popular health magazine, the future of any organization would be secure.

It has been argued that general society would not be able to enlist the sympathy and support of specialists working in restricted fields related to public health work and to organize then into effective working forces so well as can the special society. Were the general society precluded from organizing its forces along technical lines, there would be some force in this argument; but such is not the case. There is, for instance, probably no medical society of any size that has not divided its work into special fields of medical practice, for the convenience and better service of its members; and any general public health organization might well do likewise. This very Association has already set the lead in that direction and has provided sections for the special study of particular phases of public health work; and there is no reason why, if such an association were large enough, sections should not be created to any desirable extent, sections on the prevention of tuberculosis, on school hygiene, on the prevention of cancer, and so on. The very size of the larger organization, with the corresponding increase in its resources that would come with increased size, would tend to draw the sympathy and support of all scientific workers in the field of public health. It would permit the better separation of the purely administrative work of the organization from the scientific and practical work and relieve the scientific staff of the drudgery of routine administrative matters, which is almost universally distasteful to scientific workers and which can be done so much better by persons who are trained for it and who find a pleasure in the organization and discharge of administrative details. And the gathering together into one organization of experts interested in many lines of public activity would tend to broaden its views. Experts in one line would exert a corrective influence over those engaged in others. Saner and more efficient action would be assured. Faddism could not influence the association as a whole. And the association or society thus made up could speak to the public with greater authority than can any special organization.

When it comes to the actual effort of any special society to reach the community with its propaganda, what has been said with respect to the obstacles in the way of special societies in the matter of collecting funds and obtaining the support of persons specially interested in their particular fields of endeavor applies with equal force. In order to accomplish their ends, each must get into touch with persons who are specially needing its particular service, and in order to do so it must scour the whole population. And as the discards of one society are never referred to any other organization, the result is a large number of agencies scouring the entire territory in a very ineffective way, instead of one effectively searching, with a proper sorting and arranging of the results. In the search for persons interested in tuberculosis persons are encountered who are not interested in tuberculosis but who are interested in mouth hygiene; but there is no clearing house through which such persons can be put into touch with the society for mouth hygiene. Or if the society for the prevention of cancer, in its search for persons interested in the particular problems of that organization, find some one whose interests lie rather with tuberculosis than cancer, the correlation of that person and the society for the prevention of tuberculosis cannot readily be made. Each organization must by a long and expensive search throughout the entire population find the material it can best work upon. This very method of finding recruits by the appeal for the support of some particular flag is of limited efficiency even when they are found, since too often those who respond to the call are persons who are already suffering from the disease and with respect to whom prevention must take a very personal one-sided aspect. A broader appeal would reach persons not yet diseased, but interested in the problems of maintaining good health generally; in the problem of preventing disease, not merely of preventing a disease.

From what has been said it seems clear that the consolidation of all of the organizations now active in public health work into one organization would result in such efficiency and economy in the execution of such work as is not possible under existing conditions. The only question remaining to be considered is, What are we going to do about it?

If I as an individual obtain money or service without an adequate consideration, upon representations as to some particular purpose to which such money or service is to be put, I am under a moral obligation, and it may be a legal obligation, to apply such money or service to that end, in the most efficient and economical way that is open to me. Any misapplication of money or service, through intent or through negligence, is at least a breach of trust and may possibly be branded even as fraud. No matter what may in the past have been held to be true, today these same principles are universally held to apply to groups of individuals, whether they act as a voluntary association or as a corporation, with quite as much force as they apply to the individual. And the principles just stated, that today govern the operations of business men and business organizations generally, apply to the operations of the individual and the organization engaged in public health work, notwithstanding that the worker seeks no personal profit out of the duty he has assumed; for in the eyes of the law and in conscience the execution of public health work, even though voluntarily undertaken, is a business, and the money collected for its execution is a trust fund which every contributor has a right to demand be economically expended for the purpose for which given, and duly accounted for. Clearly, then, it is the duty of this Association to labor toward the end that the private agencies now engaged in the conservation and promotion of the public health be consolidated into one well-organized, efficient, and economical body.

When I say that these agencies must be consolidated into one well-organized, efficient, and economical body, I desire to be clearly understood as not meaning that they shall be necessarily and as a matter of course incorporated into the American Public Health Association. The American Public Health Association must enter upon the consideration of plans for such movement upon the very same basis as every other agency engaged in public health work. If a careful study of the situation convinces the majority of those interested that a new organization should be created to take the place of all now in the field, this Association must for the good of the cause cheerfully acquiesce and loyally abide by whatever plan may be adopted. If, however, such a study shows that the American Public Health Association, which is historically the nucleus about which this consolidation should center, is logically the body into which all should merge, this Association must look forward to such merger on terms that will allow fair part to every organization involved in it.

As a concrete step toward the consolidation of the private agencies now engaged in public health work, and as a step that will in any event contribute very largely toward the future success of this Association, wherever its future may lie, I strongly urge that provision be made before this convention adjourns for the revision of our constitution. The constitution as it stands at present is an incumbrance and not an asset. It hampers the activity of the organization. It removes from careful and mature deliberation even such an important matter as the determination of the place of meeting. The by-laws, which normally should be flexible, so as to serve the purposes of the organization, are so rigid as to make the Association merely the agent even of the by-laws. I cannot, therefore, too strongly urge action at once with respect to this matter.

In making such suggestions and recommendations as I have made, I have done so with very definite knowledge that they will be considered by a group of officers and by a membership devotedly loyal to the cause of public health and to the Association, that if they are unwise they will be carefully and discreetly laid aside, and that if they contain even a germ of merit it will be sought out and properly acted upon. I speak with knowledge upon this matter, for it has been only the loyalty and interest of the other officers and of the entire membership that has made it possible for the Association to forge ahead, as it has done during the past year, marking it as the most successful year in the history of the Association in so far as my knowledge goes; and for such loyalty and interest, I desire here to record my grateful appreciation.

THE RELATION OF THE CITY TO THE MILK SUPPLY.

NATHAN STRAUS,
New York City.

Read before the General Sessions, American Public Health Association, Jacksonville, Fla., December 4, 1914.

The protection of the health of the people of a city is an accepted obligation of the modern municipality. It is a function quite as inseparable from municipal government as the policing of the city, the maintenance of streets, protection from fire and the schooling of the children.

In the course of the development of the functions of municipal government the water supplies, provided by private enterprise, came under municipal supervision because public policy demanded safeguards against the spread of typhoid fever through infected water.

Mere supervision proved in many cases insufficient. It was found to be a post mortem protection. Typhoid came first; then measures to purify the water supplies.

Necessarily, therefore, the cities took the water supplies under their absolute ownership and control. Now waterworks are built and operated as a matter of course by municipal governments, and no one would for a moment tolerate the proposition that the supplying of water for domestic uses be turned back into the control of private corporations.

Under municipal control the water supplies have generally ceased to be sources of typhoid fever. One of the three great causes of that disease has been absolutely eliminated in most cities by having city-owned, city-purified and city-distributed water supplies.

Infected milk supplies and contact with cases of typhoid remain as the unconquered sources of the infection.

The duty of the municipality to prevent disease has been well exemplified in the improvement of the water supplies under municipal ownership. The policy, long bitterly assailed, has been vindicated.

But the duty of the municipality does not end with the supplying of pure, germ-free water. It is equally important that the people have pure, germ-free milk. I am conservative in saying that this is equally important. Milk is a universal necessity in only a slightly less degree than water. Milk, even more than water, is a carrier of the germs of disease—not of *one* disease, but of *six*, not counting the foot and mouth disease.

Water has often been responsible for outbreaks of typhoid fever.

Milk, in the raw state, is more often the cause of typhoid. Milk not infrequently carries the germs of diphtheria, scarlet fever, septic sore throat and the summer complaints of children.

And, more serious than all else that may be said of raw milk,

Milk is a common vehicle for the transmission of tuberculosis to human beings.

Addressing the American Public Health Association it is not necessary to cite evidence as to any of these facts; nor is it necessary to call to witness my twenty-three years' experience in preventing these diseases in New York City and elsewhere on two continents by supplying babies with pasteurized milk; nor is it necessary to cite the position of this Association as to the necessity for pasteurization, or the decision of the National Commission on Milk Standards, or the advice of the American Medical Association.

We have the fact that municipal government intervened and took control of the water supplies chiefly to stop the ravaging of their cities by *one* disease, typhoid fever.

My proposition is that the same policy should be followed in dealing with an article of food of universal use and necessity that is a common cause of *six* plagues.

Practically every city does undertake to see to it that the milk sold to its people is of good quality, many municipalities do endeavor to secure for their people milk that is pure and free from the germs of disease.

The obligation to do this is recognized by every municipality; the extent to which the obligation is carried out varies.

The method everywhere is supervision—the method that was tried and proved insufficient in the protection of the people from typhoid germs in water.

The plenary power of a municipal government to control the supplies of milk, wherever they come from, has been recognized and upheld in decisions of the Supreme Court of the United States.

The duty of the municipality in respect to the milk supplies is no longer disputed. The only room for discussion is as to how this duty is to be fulfilled.

By ordinances that are not enforced?

By inspection that does not inspect?

By post mortem supervision that deals with a dairyman or dealer after the raw milk has started an epidemic?

At a vast expenditure of effort a great improvement has been achieved in the milk supplies of cities. No one knows this better than I do for I have followed this work day in and day out through twenty-three long years. I am thankful for what has been done. But yet it remains true that most of the milk sold in the cities is neither pure nor safe.

The consequence is that milk-borne diseases continue to exact their toll of human lives, particularly of infant lives.

How then shall the municipal governments meet their obligation to secure to their people milk that is pure and free from germs?

I would be the last to discount or to criticise the action taken by New York City and Philadelphia, and contemplated or partially carried out in many other cities, in requiring the proper pasteurization of the milk supplies under municipal supervision.

This is the greatest step forward in the history of the modern war for the prevention of disease. It will save lives not by hundreds but by thousands. It means more than the adoption of compulsory vaccination, for that wrought the annihilation of smallpox, which was only one plague, but pasteurization spells the stamping out of six plagues.

I therefore want to commend in the strongest possible terms the measures taken for the pasteurization of the milk supplies in the cities named, and I want to urge with all my power the adoption of this program by every city as necessary to the fulfillment of its duty to protect the health of its people.

But I would be less than frank if I did not admit that I look forward to a system more efficient than pasteurization under municipal supervision.

Such supervision is of necessity occasional and lacking in complete efficiency. Its history, I believe, will parallel that of municipal supervision of the purification of privately operated water supplies. It will do much good, but finally will give way, I believe, to a system that will do more good.

Absolute municipal control of the milk supplies will, I believe, be found to be the effective way not merely to check, but to wipe out the milk-borne diseases.

This thorough control may be achieved in two ways:

By the cities taking over the function of supplying milk to consumers just as the cities have taken over the function of supplying water to each household, or,

By the cities performing the function of pasteurizing the entire milk supply and delivering the milk in sealed containers to the dealers for distribution.

Neither system means increased cost of milk, for the first wipes out the high cost of competition, with the duplication of milk routes by rival dealers, while both systems give the benefits of the economies of a few large central plants as compared with a large number of smaller plants.

As a rule the milk supplies of the smaller dealers pass through a bottling plant, which filters and bottles the milk at a charge of one cent a quart. Where pasteurization has been required such milk has been pasteurized without additional charge. Municipalities could filter, pasteurize and bottle for less than a cent a quart and thus help the small distributors.

Both systems mean fairer prices to the farmers and no higher price to the consumers.

But the protection of human life is not to be measured by its cost, but rather by the amount of sickness prevented and the number of human lives saved.

This country is awakening to the excessive cost of the Great White Plague—a cost figured in millions of dollars and of lives and in suffering and sorrow that is incalculable.

With this awakening there will come, I believe, a demand similar to that that led the municipalities to take over the function of supplying water, and as the people realize the bearing of milk upon the spread of six plagues, of which the greatest is tuberculosis, I feel sure that there will come irresistible insistence upon the absolute assurance of safety from these infections that can be had only in the municipalization of the milk supplies.

I think the time has come to recognize these facts frankly—the time to insist urgently upon pasteurization and to consider and work out the problem of making this protection thoroughly efficient by municipal pasteurization.

In addressing the Presidents of Health Boards of American and Canadian cities on March 22, 1897, I said:

"The tragedy of needless infant slaughter by infected milk, desolating so many homes and wringing so many hearts, lies like a dark shadow on our boasted civilization. It is nothing more nor less than permitted murder, for which the responsibility must lie at the door of the agencies of government that fail to recognize its existence and demand its prevention. The necessity is too great to be adequately met by private effort. Nothing short of an organization as broad as the area of milk consumption will meet the case, and this only public authority can supply."

On November 15, 1900, I wrote:

"If the pasteurizing of the entire milk supply were made the function of the municipality, it would be an exceedingly clever business investment, for the money expended would be returned a hundredfold. This is looking at it from a practical, commercial standpoint, besides which, from a humanitarian point of view, the amount of suffering and disease which would be prevented is incalculable."

Since then the necessity for pasteurization has been recognized and declared by the United States Public Health Service and by the representative medical and health organizations of America, and the enforcement of pasteurization has become the settled policy of the health authorities of the greatest American cities.

I pray devoutly for the forwarding of this great work and I look forward to the time when pasteurization will be made thoroughly effective by the municipalization of the milk supplies.

That we must have pure water is recognized and we get it through municipal control; that we must have pure milk is now equally well recognized, and I believe we will get it through municipal pasteurization.

THE COMING MOVEMENT FOR EXTENDING HUMAN LIFE.

Prof. Irving Fisher,
Yale University, Chairman of the Hygiene Reference Board of the Life Extension Institute.

Read before the General Sessions, American Public Health Association, Jacksonville, Fla., December 4, 1914.

There is no need to prove to the members of this Association that the extension of human life is a practicable undertaking; for most of our members are engaged in accomplishing this very task. By all who have come in contact with preventive sanitation and medicine the old idea of an iron law of mortality has been utterly abandoned. In its place, our boards of health are now proclaiming that health and long life are purchasable commodities.

But while we are already agreed that human life is extensible, we are not so fully agreed as to the best methods to be employed for extending it. In fact for several years a few students have been suspecting that the work of prolonging life as it is at present being conducted is not pursued in the most effective manner and that, in particular, we are neglecting one of the most, if not the very most, promising means of all—individual hygiene.

Our present methods have their roots, for the most part, in the work of Pasteur. Ever since Pasteur made his epoch-making discoveries and uttered his inspiring words, "It is within the power of man to rid himself of every parasitic disease," health workers have sought to secure their results almost wholly in the single direction which he indicated, *i. e.*, by attacking our infinitesimal parasitic enemies.

Far be it from me to disparage these efforts. On the contrary, we should, by all means, continue in them without interruption or relaxation. The success of Gorgas at Panama, to say nothing of that of numerous other public health officers, affords proof positive of the great and immediate returns which well-directed sanitary effort is certain to bring. These returns are strikingly shown by the great acceleration in the rate of life-lengthening which came on the advent of Pasteur and modern sanitation. In the report on National Vitality, of the Roosevelt Conservation Commission, a summary of European life tables shows that human life lengthened during the seventeenth and eighteenth centuries at the rate of only four years per century and that during the first three quarters of the nineteenth century it lengthened about twice as fast, but since that time it has been lengthening more than four times as fast or about seventeen years per century. These figures would seem large enough to satisfy the most ambitious, and certainly if life could continue to lengthen at the rate of seventeen years a century, after a few more centuries the world would be populated mostly by Methuselahs.

But our prospects are not so bright. In fact there is a large element of gloom. When we analyze the nature of the present improvement, we find it due chiefly to a decreased loss of life from infection before middle age *in spite of an increased loss of life after middle age from degeneration.* Such a process bids fair soon to change our net gain in the average life span into a net loss. The truth is, we are witnessing a race between two tendencies, a reduction of the acute or infectious diseases, such as typhoid, and an increase in the chronic or degenerative diseases such as arteriosclerosis and Bright's disease. By the degenerative diseases is meant those which consist in the degeneration or wearing out of the vital organs. It may be difficult always to distinguish between infectious and degenerative diseases, but that there is a broad distinction cannot be doubted. Statistics, in all countries for which they exist, excepting only Sweden, England and Germany, show that the expectation of life after middle age is distinctly declining and that there is an ominous increase in the death-rate from the chief degenerative diseases.

Still more alarming for us in the United States is the fact that this degenerating tendency seems to be more in evidence here than elsewhere. The degenerative diseases in England are remaining stationary and the expectation of life after middle age is also stationary. In Sweden we find the expectation of life increasing at all ages. There, even the nonagenarians of today have more years to live than did those of former days. In the United States, however, the degenerative diseases are increasing rapidly. The Census reports show that the number of people now dying from diseases of the blood vessels is nearly four times as great as a decade ago. There is also, as Dr. Dublin has shown, some evidences, in spite of the improvement in mortality, of an actual increase in morbidity. Tredgold in England has given statistics secured from a number of friendly societies with a total membership of nearly one and one-half millions, which would seem to prove a very distinct increase of morbidity.

The great broad fact seems to be that while we are freer of germs than our ancestors, our vital organs wear out sooner. There may be some difference of opinion as to the cause of this more rapid wearing out. But, personally, I believe, it can be convincingly shown that the chief cause is the neglect of individual hygiene, partly from ignorance, partly from indifference, partly from sheer helplessness under modern industrial conditions. The degeneration of our bodies follows a degeneration of our habits. It is especially significant that, in England, where the degenerative diseases are not increasing, individual exercise, out-of-door sports for the masses, and self-care are, apparently, not declining, or not declining fast; and it is still more significant that in Sweden, where there is improvement at all ages, the interest in individual hygiene is the greatest in the world. It is the only country where public health includes private habits and touches the life of the people, especially through the public schools.

Strong corroboration of these broad facts and inferences has been forthcoming in the last six months from the experiences of the Life Extension Institute. The Life Extension Institute aims to be a self-supporting philanthropy. It began its work a few months ago with ex-President Taft, Chairman of the Board of Directors; Mr. Rittenhouse, President; Colonel Gorgas, Consultant in Sanitation; Dr. Eugene L. Fisk, Director of Hygiene; and a Hygiene Reference Board consisting of many experts and a few lay enthusiasts like myself. Its chief work at present consists of medical examinations to discover possible physical impairments, carrying out a suggestion made some years ago by Dr. Burnside Foster to the Association of Life Insurance Presidents.* These medical examinations are made partly for Life Insurance Companies, like the Metropolitan among their policy holders; partly for industrial concerns among their employees; and partly for individuals. Not all of the figures so far accumulated have as yet been tabulated but some of the first results, not yet published, are here presented as worked out by Doctor Fisk, the Director of Hygiene. They constitute the first general physical survey of sample groups of our citizens and reveal conditions of impairment which are truly astounding. They include about 2,000 medical examinations of employees of the commercial houses and banks in New York City among young persons, mostly young men, with an average age of thirty.

Only 3.14 per cent. were found free of impairment or of habits of living which are obviously leading to impairment. Of the remaining persons 96.69 were unaware of impairment. 5.38 per cent. of the total number examined were affected with organic heart trouble, 13.10 per cent. with arteriosclerosis, 25.81 per cent. with high or low blood pressure, 35.63 per cent. had sugar, casts or albumin in the urine, 12.77 per cent. with combination of both heart and kidney disease, 22.22 per cent. with decayed teeth or infected gums; 16.03 per cent. with faulty vision uncorrected. These figures are especially surprising because of the large number of young men and young women suffering from diseases of the heart, kidney and circulatory system. The fact of greatest import, however, was that impairment sufficiently serious to justify the examiner in referring the examinee to his family physician for medical treatment was found in 59 per cent. of the total number of cases. In other words, considerably over half of the young men and women in active work, and presumably selected for their work as especially "fit" were found, although unaware of the fact themselves, to be in need of medical attention, while 37.86 per cent. were on the road to impairment because of the use of "too much alcohol" or, "too much tobacco," constipation, eye-strain, overweight, diseased mouths, errors of diet, and so forth.

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*This suggestion we now find was made by many others; the earliest and most complete scheme for medical re-examinations was made twenty-four years ago by Dr. George M. Gould, the well known oculist.

Whatever we may say as to the significance of these figures, we must at least conclude that young men and women today, even in their twenties, are unwittingly laying the foundation for heart disease, Bright's disease, and the other chronic, progressive, or degenerative ailments which sooner or later will cause their death. It would seem that today men and women begin to die almost as soon as they are grown up, but are dying so slowly that neither they nor their physicians suspect the process until death stares them in the face. What would we think if such a per cent. of impairments were found in a dairy herd or a flock of sheep!

On the principle that "a stitch in time saves nine," the early diagnosis and prompt treatment, in the incipient and easily curable stages, of the degenerative diseases should be the next great step forward in the fight for improving national vitality. Dr. Rankin, Health Officer of North Carolina, at a meeting last spring of the Hygiene Reference Board of the Life Extension Institute, declared that he thought the time would soon come when our health boards would need to "swing over," as he expressed it, their emphasis from sanitation to hygiene, and institute free medical examinations. The proposition is so simple that it is astonishing to think that we have waited so long before finding out the vast extent of the need. No factory owner would allow his machinery to go uninspected until it broke down. Yet that is precisely what we have done with the human machine. Worse still, we have scarcely studied, much less advocated, those simple rules of hygiene by which and by which alone the degenerative diseases must be prevented. We need to know more of what errors we may be committing according to the laws of physiology. Is our diet, for instance, too acid and too little alkaline? Do we take our food too concentrated? Are the common drugs we use in beer, cigarettes, tea and coffee, seriously harmful? These and numerous other questions are not yet settled in our minds because most physicians and health officers have not yet seriously concerned themselves with them. The old idea of the ancient Greeks, of cultivating a sound mind in a sound body by the exercise of simple personal hygiene through the proper use of air, food, rest, exercise, bathing and wholesome recreation, was utterly forgotten during the middle ages, when, in the quest for spirituality, the absurd doctrine was promulgated that the flesh is gross and in league with the devil. Mediæval artists associated saintliness with sickliness and chose consumptives for their models. Pasteur has only partly released us from mediævalism. We still need to add to our resources of hygiene what we had formerly subtracted from them when we abandoned the Greek ideals.

In our respect for the work of the laboratory we forget the obvious promptings of common sense. Rubner has in substance said that we are so intent on studying unexplored regions of bacteriology that we forget common physiology. The gains in human vitality which we can secure from applied physiology will, I believe, prove as surprising as those we are already securing from applied bacteriology. To this end we need to formulate scientifically what constitutes a wholesome life and to educate the public on what changes from existing customs are necessary to live that life. Furthermore, in the industrial world we must in some cases compel wholesome physical and mental conditions for our working people. The time has come when science must subdue custom and reason triumph over tradition.

TYPHOID FEVER AND ITS SEQUELÆ.

LOUIS I. DUBLIN, PH. D.,
Statistician, Metropolitan Life Insurance Company, New York, N. Y.

Read before the Section on Vital Statistics, American Public Health Association, Jacksonville, Fla., December 4, 1914.

Our problem in this study was to measure the effect of typhoid fever upon vitality during the first three years following recovery, and also to note the causes of death which predominate during this period.

RECORDS USED.

For this purpose, we turned to the reports of the Visiting Nurse Service of the Metropolitan Life Insurance Company for the year 1911. In that year, 1,936 cases of typhoid fever were recorded. A fairly complete record of the illness in these cases was available. A further advantage in this series was the fact that the subsequent whereabouts and condition of those who were treated could be obtained from the insurance records. In this way, we could at once be informed with regard to the present status of these persons; whether they were living or dead, the date of death, as well as a complete record of the conditions at death in these later cases. It was, in other words, possible for us to trace this series fairly completely and to determine the consequences and effects of typhoid fever on these persons.

An examination of our 1,936 cases led to the elimination of 362 in which the record did not appear satisfactory from the point of view of accuracy of diagnosis. As a result, we had, after careful analysis, a residue of 1,574 cases. All of these presented satisfactory evidence, so far as such records alone could, that the patient had suffered from an attack of "typhoid fever" at the time of 1911 nursing. The cases were in the hands of physicians and nurses. The treatment of the disease in every case indicated typhoid fever. The duration of the service as well as the large number of visits made, all pointed conclusively that our series was well selected and sound. The average number of visits made per case by our Visiting Nurse Service to these patients was close to seventeen (16.85) and the duration of nursing was close to twenty-four (23.87) days.

DISTRIBUTION BY AGE AND SEX.

Table 1 shows the distribution of the 1,574 cases by age and sex. It will be noted at once that 70.3 per cent. of the total cases were under twenty years of age and that 34.1 per cent. were under ten years. This proportion is somewhat higher than that usually observed in other typhoid fever series. The explanation lies in the fact that our Visiting Nurse Service is more readily availed of by women and children. It is important also to remember this large incidence at the earlier ages in view of its bearing on our findings later with reference to the sequelæ.

TABLE 1.

DISTRIBUTION BY AGE AND SEX OF 1,574 CASES OF TYPHOID FEVER.

Visiting Nurse Service, 1911, Metropolitan Life Insurance Company.

Age period.	Males and females.		Males.	Females.
	Number.	Per cent.		
Under 10	536	34.1	251	285
10–19	570	36.2	254	316
20–29	230	14.6	85	145
30–39	114	7.2	35	79
40–49	81	5.2	23	58
50 and over	43	2.7	17	26
Total—all ages	1,574	100.0	665	909
Per cent. of total—by sex		100.0	42.3	57.7

Lethal Rates.

Table 2 presents the lethal rate per 100 treated for each period. The least rate is that for the children under ten; the highest trustworthy rate is for the group 20–29 which was 13.91 per 100. At the higher ages there are too few exposed to make the rate dependable. For the entire series of 1,574 cases treated, the lethal rate was 9.28 per 100 treated. This figure is consistent with that of other series which vary slightly above and below a mean of 10 deaths per 100 cases treated.

TABLE 2.

LETHAL RATES PER 100 CASES TREATED FOR TYPHOID FEVER—CLASSIFIED BY AGE PERIOD.

Visiting Nurse Service, 1911, Metropolitan Life Insurance Company.

Age period.	Number treated.	Number died under treatment.	Lethal rate per 100 treated.
Under 10	536	36	6.72
10–19	570	45	7.89
20–29	230	32	13.91
30–39	114	12	10.53
40–49	81	13	16.05
50 and over	43	8	18.60
Total—all ages	1,574	146	9.28

Complications.

Table 3 shows the complications in these 146 cases. These are important in view of our interest in the sequelæ to be referred to later. Interest should be centered in the fact that over 15 per cent. involve intestinal perforation, hemorrhage, peritonitis and other similar conditions. Meningitis and pneumonia were present in 10.3 per cent. of the fatal cases, heart conditions in 8.2 per cent. of the cases. Other complications, such as tuberculosis and acute nephritis indicated that the lungs and kidneys were impaired in a considerable number of cases in connection with the typhoid infection.

TABLE 3.

COMPLICATIONS IN 146 FATAL CASES OF TYPHOID FEVER.

Visiting Nurse Service, 1911, Metropolitan Life Insurance Company.

Complications with typhoid fever.	Number of deaths.	Per cent. of total deaths.
No complications stated	60	41.1
Intestinal perforation, hemorrhage	22	15.1
Meningitis	15	10.3
Pneumonia	15	10.3
Heart involvements	12	8.2
Tuberculosis (all forms)	8	5.5
Acute nephritis	4	2.7
Other complications	10	6.8
Total fatal cases	146	100.0

Distribution of Recovered Cases.

Table 4 shows the distribution by age and sex of the 1,428 persons who recovered from the typhoid fever. This distribution is very slightly different from that of Table 1 which showed the distribution of the initial cases.

Relation Actual to Expected Mortality.

From this point onward, our effort was directed to a comparison of the actual and expected mortality among the 1,428 survivors. Our method was as follows: The 1,428 cases were distributed by sex and color and by ten-year age periods. A separate schedule was prepared for each sex and color. The mortality rates of the Company for each individual age, sex and color class was employed as a standard. We assumed that the mor-

TABLE 4.

DISTRIBUTION BY AGE AND SEX OF 1,428 PERSONS WHO RECOVERED FROM TYPHOID FEVER.

Visiting Nurse Service, 1911, Metropolitan Life Insurance Company.

Age period.	Males and females.		Males.	Females.
	Number.	Per cent.		
Under 10	500	35.0	239	261
10-19	525	36.8	232	293
20-29	198	13.9	68	130
30-39	102	7.1	30	72
40-49	68	4.8	14	54
50 and over	35	2.5	9	26
Total—all ages	1,428	100.0	592	836
Per cent. of total—by sex		100.0	41.5	58.5

tality actually experienced in 1911 by the Company in the Industrial Department should serve as the measure of the expected deaths for the corresponding group of these persons who had recovered from typhoid fever in 1911 for the first year after recovery. For the second year after recovery, we employed similar mortality figures for the year 1912 as a standard and for the third year we employed the figures for 1913. In other words, the mortality table used was not an arbitrary measure but exhibited the death-rates which persons of the same sex, color and age among our Industrial policyholders actually experienced. By throwing these rates into the number of years of life of each group in successive years since recovery we obtained the number of expected deaths for each age period.

In this way we found, as shown in Table 5, that in the series of 1,428 persons the expected number of deaths was equal to 26.45. As a matter of fact, our record showed 54 actual deaths. The ratio of actual to expected deaths was, therefore, for our entire series, 204 per cent. In other words, more than twice the mortality expected was realized. You will note that the total number of years of life was nearly 3,850 years.

A number of persons dropped out, either by death or lapsing their policies during the first, second or third year after recovery. Each such exit from our series involved an adjustment in the number of years of life exposed to risk, by taking the proportionate part of a year from the date of recovery to the date of exit. In this way, every day of experience was used. Fortunately, the fullness of the Company's record made this much desired

TABLE 5.

COMPARISON OF ACTUAL AND EXPECTED MORTALITY IN THREE YEARS FOLLOWING RECOVERY FROM TYPHOID FEVER—CLASSIFIED BY AGE PERIOD.

CASES TREATED BY VISITING NURSE SERVICE, 1911, METROPOLITAN LIFE INSURANCE COMPANY.

Age period.	Number of years of life.	Number of expected deaths.	Number of actual deaths.	Per cent. actual of expected deaths.
Under 10	1,354.15	8.07	13	161
10–19	1,434.66	5.61	12	214
20–29.	521.27	3.92	13	332
30–39	274.16	2.94	5	170
40–49........	173.05	2.46	8	325
50 and over	92.62	3.45	3	87
Total—all ages....	3,849.91	26.45	54	204

step possible. It would be difficult in many other services to keep such complete control of the whereabouts of the individuals composing a large series. Our conclusion from our own series is, therefore, that during the first three years after recovery from typhoid fever, the mortality is twice the normal.

It is interesting to note, however, that this increased rate is not uniformly evident in all the three years of the series. Thus, in the first year following recovery from typhoid fever the ratio of actual to expected deaths was 284, in other words nearly three times as great as it should be. In the second year, the percentage actual of expected deaths was 217, and in the third year it fell below the expected, namely to 80 actual deaths per 100 expected deaths. This last fact is puzzling. A careful reëxamination was made of our series. No effort was spared in finding a possible source of error and yet at the very end, we find no evidence of an additional death which would in any way change our figure.

It would appear from our figures that typhoid fever has its impairing effect in the first two years after recovery. It would seem, although we would not press this explanation, that the weaklings had been eliminated by the immediate deaths and those that followed in the first two years after recovery. Table 7 shows the causes of death in the 54 cases that occurred in the three years subsequent to recovery. Tuberculosis heads the list with twenty-one deaths (39 per cent.), of which all but three cases were of the pulmonary type. The second important group are the diseases of the heart with a total of eight cases. Pneumonia, and kidney disease follow with four cases each.

TABLE 6.

COMPARISON OF ACTUAL AND EXPECTED MORTALITY IN EACH OF THREE YEARS FOLLOWING RECOVERY FROM TYPHOID FEVER—CLASSIFIED BY AGE PERIOD.

Cases Treated by Visiting Nurse Service, 1911, Metropolitan Life Insurance Company.

Age period.	First year after recovery.			Second year after recovery.			Third year after recovery.		
	Number of		Per cent. actual of expected deaths.	Number of		Per cent. actual of expected deaths.	Number of		Per cent. actual of expected deaths.
	Expected deaths.	Actual deaths.		Expected deaths.	Actual deaths.		Expected deaths.	Actual deaths.	
Under 10	3.73	4	107.	2.54	5	236.	1.80	3	167
10–19	1.86	8	430.	1.91	4	209.	1.84	....	....
20–29	1.45	3	207.	1.31	7	534.	1.16	3	259
30–39	1.06	5	472.	1.00	....	....	.88	....	....
40–49	.88	7	795.	.82	1	122.	.76	....	....
50 and over	1.24	2	161.	1.16	1	86.	1.05	....	....
Total—all ages	10.22	29	284.	8.74	19	217.	7.49	6	80

Our conclusion, then, from this table is that the incidences of tuberculosis and the diseases of the heart are increased subsequent to typhoid fever. This is borne out by the previous statement of complications which occurred in the immediate deaths, Table 3, where a considerable number of cases showed heart and pulmonary complications. This condition has been noted consistently by other observers of typhoid fever and its sequelæ.

EFFECT OF SEQUELÆ UPON GENERAL DEATH RATE.

We will close this paper with an estimate of the effect of typhoid fever upon mortality in the three years subsequent to an attack. On the basis of the estimated population of Continental United States in 1914, we have calculated that each year a minimum of close to 8,000 deaths occur which can be attributed annually to the impairments which follow typhoid fever. In this estimate, we have assumed a minimal death-rate from typhoid fever of 20 per 100,000. We have also assumed the number of cases to be ten times as great as the number of deaths in accordance with the usual practice. The number of recoveries, therefore, is 90 per cent. of the cases. For each of the three years following, we have assumed an expected death-rate for the entire country to be at least 15 per 1,000 from all causes. A calculation of the additional deaths due to sequelæ of typhoid fever gives us a

TABLE 7.

CAUSES OF 54 DEATHS IN THREE YEARS FOLLOWING RECOVERY AMONG 1,428 CASES OF TYPHOID FEVER.

TREATED BY VISITING NURSE SERVICE, 1911, METROPOLITAN LIFE INSURANCE COMPANY.

Cause of death.	Number of deaths.	Per cent. of total deaths.
Tuberculosis:		
Pulmonary	18	33.3
Other forms	3	5.6
Diseases of the heart:		
Endocarditis	4	7.4
Myocarditis	2	3.7
Valvular disease of the heart	2	3.7
Pneumonia	4	7.4
Nephritis:		
Acute	1	1.9
Bright's disease	3	5.6
Acute articular rheumatism	2	3.7
Violent causes	7	13.0
Other causes	8	14.8
Total—all causes	54	100.0

total of 7,781. This is the price that is paid annually over and above the registered direct loss from typhoid fever according to the results of our study. It is not only the 20,000 immediate deaths that we have to consider, but the additional 8,000 who, although recovered, cannot survive the strain which modern industrial life makes necessary and who either because of tubercular or cardiac lesions die untimely deaths within the first or the second year after recovery.

TABLE 8.

ESTIMATED NUMBER OF DEATHS TO BE ATTRIBUTED ANNUALLY TO SEQUELÆ OF TYPHOID FEVER IN THE UNITED STATES.

Population, Continental United States, 1914	98,781,324
TYPHOID FEVER:	
Death rate per 100,000, Continental United States, 1914 (minimal estimate)	20
Deaths in United States in 1914	19,800
Cases in United States in 1914	198,000
Recoveries, each year, in United States	178,200
Extra deaths to be attributed annually to sequelæ of *typhoid fever.* (On basis of double mortality in three years following recovery)	7,781

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PUBLIC HEALTH IN MASSACHUSETTS.

The appointments by Governor Walsh to the reorganized State Department of Health of Massachusetts are eminently satisfactory to Massachusetts medical men and sanitarians, and in other communities will command approval on account of the high character of the men selected. When it became evident that there was insistent demand for the reorganization of the State Board, the Governor took a position that is to be commended, and for the details of the plannings he turned to the physicians of the state.

In the conference that was called the dominating note was the desire for the best possible service and his Excellency reiterated his assurance that politics must stand aside for efficiency in the selection of the new officials.

In its final form the Act is quite different from the draft presented at the conference. The changes did not improve it, but it did establish the kind of board that was generally desired, a Health Commissioner and an Advisory Council.

It must be placed to the credit of the Governor that despite enormous pressure he fulfilled his promise to the conference.

Dr. A. J. McLaughlin, the Health Commissioner, on whom now rests the administrative burdens, has an excellent reputation as a sanitarian. He comes to Massachusetts with world-wide sanitary experiences that fit him for command in a Commonwealth with its ports filled with shipping; he is accustomed to large things as is evidenced by his work in the Philippines and he is at home alike in health questions of land and water.

The sanitarians that comprise the Advisory Council will be difficult to match in any community in the world; most of them are men of international reputation. It includes Professor William T. Sedgwick, President today of the American Public Health Association, the man who foresaw twenty-five years ago the coming demand for sanitarians and whose pupils are doing health administration and research in all parts of the country; Dr. M. J. Rosenau, with his experience gained in the large ports of Europe and an education in administration such as Washington alone affords; and Professor G. C. Whipple, a sanitary engineer of international reputation. The selection is the more significant in that these three men were named by Harvard University and the Massachusetts Institute of Technology to head the Coöperative School for Health Officers. Governor Walsh has taken an important leaf from the book of the educational institutions.

The other three members of the Health Council are men who have been quietly doing good things in their own communities. Dr. W. J. Gallivan is one of the Health Commissioners of Boston, whose development of the child hygiene work in Boston has been eminently successful; Dr. D. L. Edsall of the Harvard Medical School and Massachusetts General Hospital, with expert knowledge of industrial hygiene and Doctor Lamoreaux of Lowell, on the staff of the largest local hospital, with a reputation in public service already established as the efficient head of the School Board.

With so excellent a Health Board appointed, Massachusetts should see to it that some defects in the fundamental Act are remedied.

FROM ONE OF THE FOUNDERS OF THE AMERICAN PUBLIC HEALTH ASSOCIATION.

January 14, 1915.

Professor S. M. Gunn,
Secretary American Public Health Association,
755 Boylston Street, Boston, Mass.

My Dear Professor Gunn:

I beg to acknowledge the receipt of a copy of a resolution, passed at the last meeting of the American Public Health Association, congratulating me on the continued enjoyment of health, and its joy and pleasure in being able to illustrate the outcome of my efforts and those of my colleagues in the present prosperity of the Association.

I desire to assure you and through you the Association that I deeply appreciate this very kind and complimentary token of remembrance of the labors of the founders of the Association who, nearly half a century ago, met at Atlantic City, few in numbers but earnest in purpose, and planted the germ of that tree whose leaves "were for the healing of the nations."

It has been a source of infinite happiness to witness from year to year the growth and expansion of the Association under most intelligent and judicious management. As, like Job's messenger, "I only am escaped alone to tell thee," allow me on my own part and in memory of my departed colleagues to congratulate the officers and members of the American Public Health Association on the exalted position which the Association has attained as the exponent of the scientific principles on which the promotion and conservation of the public health is based.

Truly yours,

Stephen Smith.

A CAMPAIGN AGAINST QUACKS.

W. A. Evans,
Chicago, Ill.

Read before the General Sessions, American Public Health Association, Jacksonville, Fla , December 2, 1914.

Public health work is in its beginnings. The present public health activity is merely a curtain raiser. A few years from now twenty fields will be occupied where one is occupied now. Even at the present time it is easy to see where public health work could be better done were there no advertising doctors and no patent medicines. When we include venereal diseases among the contagious diseases, busy ourselves with drug addictions and undertake the work of personal hygiene, the relation of quacks and patent medicines will come more plainly into view.

The quack doctor and patent medicines are products of the same stock. This plant is rooted in the methods and practices of the orthodox medical profession. It will not be possible to eradicate the two-headed plant without a change in some of the orthodox medical methods.

I have the privilege of editing and controlling one department in a great newspaper. One of the fundamental principles of that paper is that it is charged with the responsibility of advocating policies and principles. It is their opinion that under our government, for reasons constitutional and historical not necessary to enter on here, human rights have not had a fair chance when they have found themselves in opposition to property rights. It was to contribute to a change in that point of view that this department was founded.

In order that this might be accomplished with reasonable promptness it is necessary that the thoughts of men should be concentrated on prevention, public and personal hygiene, right living—on health, rather than on disease and its cure. People must take few drugs. Thought must be trained to prevention rather than cure.

By reason of the fact that they were selling advertising they were at once called upon to decide what would be their attitude toward quack doctors and patent medicines. Without hesitation they decided that no medical men would be allowed to make use of *Tribune* advertising space. In this particular field there are few borderline cases, few questions difficult of decision. The ordinary clerk at the advertising counter is able to decide.

When it comes to patent medicines the problem has proven much more difficult. Whisky, brandy, rum and gin advertisements are not considered. No out and out internal medicine claiming curative powers is allowed. Nothing containing any habit-forming drug is allowed. We do take such laxatives and purgatives as are thoroughly established as such in the public mind. We do take liniments.

Taking as little as we do there are many borderline cases—cases in which I am called on to decide, and ofttimes I find it difficult to get information on which to form an opinion. For instance, it is often difficult to draw the line between foods and medicines.

We could not have undertaken to decide these questions rightly without having our minds directed to the underlying causes for quackery. These I will presently undertake to develop.

The community having come to have confidence in us in matters relating to health began to complain to us of medical abuses. They told us of having been robbed by advertising doctors and disappointed by patent medicines.

It was plain that Mr. Underwood was wrong. If patent medicine was the poor man's medicine it was because it made him poor. If the quack doctor was the poor man's doctor it was because of robbery by the quack. There were so many of these complaints that we decided that it was our duty to so thoroughly expose the quack as to put him out of business.

As we studied the situation we saw that the quack began medicine as a cheap graduate of a cheap school. As he could not belong to medical societies and was not a student he was always about ten years behind the times.

What was his capital? Publicity.

What was the remedy? Obviously, publicity.

The plan outlined was to discover the facts and to give them publicity, to meet publicity with publicity; to publish such facts as that old Doc Sweany graduated from the Medical College of Indiana now defunct many years ago; that he never belonged to a medical society and had no other facilities for keeping abreast of the time; that he had never discovered or perfected a method. But to give publicity to these facts would not have much weight with the people. Instead of that we worked out a plan that would appeal to the public because the routine was exactly that followed by the ordinary man applying for treatment.

We took one or more bright young reporters and drilled them on what to say and how to act. The reporter was to go to the doctor's office as a patient, answer the usual questions asked, submit to an examination, discuss terms, listen to what was said, watch what was done, pay his fee, come away and write up what happened exactly as it occurred.

The men selected were thoroughly examined by several physicians and given certificates of good health. There was nothing in their disease histories on which any treatment could be based. Our best man was a skinny-looking but sound as a dollar young fellow in perfect health. I think it was Lazarus who had divers diseases but Lazarus at his worst never had the divers diseases as badly as Kendall.

As you will note, physical qualifications as well as mental equipment was required of these reporters. The story learned by them was based upon the complaints previously registered with us. It was one on which no one but a fool or a knave could base a diagnosis of disease or found a treatment. Where urine or other specimens for laboratory examinations were required the specimens were faked. A urine would be fabricated from tap water and a little coloring matter. The stories, plain recitals, were written up and recorded at the office. When these were compared it was plain that the doctor made a guess as to what disease would most readily frighten the supposed patient and then pounded away on that disease with great circumstance and much embroidery.

The following was typical of Mr. Kendall's experiences.

October 10. "I visited Dr. I. W. Hodges, second floor of the Crilly Building, 35 So. Dearborn Street, today. I gave the name of H. Vanderveen. 'What is the matter?' asked the doctor when I entered. 'Nervous,' I said. 'Wanted to have you look me over. I haven't been feeling very well.' He looked at my tongue and said it was badly coated. Then he examined my eyes with a magnifying glass. 'Appetite?' he asked. 'Sometimes good. Sometimes bad.' I told him I was worried over my health because I couldn't enjoy the work I was doing—inside work over a desk. 'I think that something is wrong with your urinary tract,' he said. He asked me to bring him a specimen tomorrow. He said his bill would be reasonable and to feel perfectly safe. He did not require any sort of a deposit.

"On the walls of his office are pictures of persons in various degrees of syphilis. He ushers patients out of the office by a rear passage."

October 11. "I called on Dr. I. W. Hodges again today. I delivered to him a bottle which he had provided yesterday, filled with a mixture of water, ammonia and anilin, obtained from the American Medical Association. 'I will have to examine this, Mr. Vanderveen,' he said. 'It will take me ten or fifteen minutes. Wait here.' He returned in about ten minutes. 'Be patient, Mr. Vanderveen, I don't want to say I know what's wrong until I have thoroughly examined the contents of the bottle. I think there is uric acid in it.' In ten minutes he returned again and examined the prostate gland. 'Very sensitive, very sensitive, young man. I will have to make a further examination.' 'What is the prostate gland?' I asked him, 'and how serious is the trouble?' 'It is a gland just at the neck of the bladder. It might be said that it controls the nervous system. When that is deteriorated you are nervous. You are run down and have no desire for work.'

"He went out and returned in a moment; then asked me to step into his assistant's office. The assistant, named 'Smith' (he said), examined me further. 'Very much enlarged,' he said with a long face, 'very much more than I expected. I want to give you treatment.' 'How much will it cost?" I asked. 'Well, the regular price for this treatment is fifty dollars. You had better take it. You are facing a dangerous thing. Considering your condition financially, I think we can give you the treatment for thirty-five dollars. How much can you pay now?' 'Three dollars is as much as I can give,' I replied. 'We don't like to take less than five. How often can you make payments?' I told him once a week and he seemed satisfied. 'I guess that is enough for this afternoon,' he said. 'I will want to give you another kind of treatment soon, but you are in too delicate a condition now for it. Come in Monday night.' He escorted me to his drug dispensary and provided me with a bottle containing a red fluid. It was marked 'Private formula.' He seemed worried about my condition. 'Now, Harry,' he said when I left, 'I am glad you came to us. You are in a serious condition.' Then he handed me a small packet of pills."

The material was then submitted to the editorial, medical and legal departments and, when O. K.d by them, was run in the most prominent space in the paper. At once we were precipitated with a flood of letters and personal interviews reciting experiences. Stories of this sort filled the paper for weeks. They made good reading. Here is a sample:

A girl working in a candy factory for less than six dollars a week had managed to save nearly a hundred dollars. She developed a cough. A quack took her one hundred dollars and gave her some treatment. She had to keep at work in the factory as she had no money. We had her examined. She was found to be anemic, undernourished and with an active, moist consumption.

The effects were magical, instantaneous and far-reaching. The newspapers that were taking the advertisements of physicians threw them out. The papers printed in languages other than English met and by formal vote decided to take no advertisements from quack doctors. Many of them agreed to follow the lead of the *Chicago Tribune* in the matter of advertisement of medicines as well as those of medical men. Almost daily I am asked by some newspaper whether they shall accept some medical ad. The following is a sample letter:

"*Chicago Tribune*—Gentlemen: Do you know anything about enclosed doctor? He sent us copy for ad., but we refused to run it until we learned that he was no fake, for we don't want to use any advertising unless we know parties to be all right. Let us hear from you." (Nauvoo, Ill., *Rustler.*)

Another illustrative letter is as follows:

"Dear doctor: Your article entitled 'Swindled by Quacks' interested me greatly. Some ten years ago I was the cause of cheating one of the quacks, the Dr. Tillotson Co., now out of business, out of $75.00. At that time the secretary of that institution was a customer of ours and had explained their methods of employing as a case taker only a doctor of unusual size and impressive appearance who, by reason of such size and appearance, could be depended upon to scare the patient in believing that he was doomed unless he put himself in their care.

"I was leaving the office of this institution one day when I met a friend of mine coming up the stairs. I hailed him and upon investigation found that he was about to be married and, fearing that he was not physically fit, had come to the doctor to find out his condition. He had been told that he had a bad case of varicocele and that unless he was treated at once, for $100.00, this would result in insanity should he dare to get married. He was literally scared stiff and gave them a retainer of $25.00. I asked him whether he had consulted his family physician and he told me that he was ashamed to do so. I made him come back to our store and after a long talk with him persuaded him to follow my advice and see his physician. Several weeks later I met my friend and he told me he had taken my tip with the result that his physician had laughed at him, made an examination and found that the only thing the matter with him was that he was out the $25.00 which he had paid the Tillotson Company.

"I meet this friend of mine occasionally and he never fails to thank me for getting him out of the clutches of that institution and tells me he was nearly crazy with worry when I started him on the right track.

"I believe that, when the relation of physician and patient is based on friendship and not fear, that there will be no place for quacks and advertised curealls."

I may say that in advising these papers as well as in coming to a conclusion in our own matters we are advised almost daily by Dr. Cramp of the *Journal of the American Medical Association.*

The police department assigned some plain clothes men to gather evidence against these swindlers and a series of prosecutions resulted. The post-office authorities increased their activities against these swindlers. Their investigators, by decoy letters and personal visits, were able to secure evidence on which fraud orders were issued. The city council passed the Printers Ink Bill:

"Any person, firm, corporation or association who, with intent to sell or in anywise dispose of merchandise, securities, service, or anything offered directly or indirectly to such person, firm, corporation or association to the public for sale or distribution, or with intent to increase the consumption thereof, or induce the public in any manner to enter into any obligation relating thereto, or to acquire title thereto, or any interest therein, makes, publishes, disseminates, circulates, or places before the public, or causes directly or indirectly, to be made, published, disseminated, circulated or placed before the public, in this city, in any newspaper or other publication sold or offered for sale upon any public street, sidewalk, or other public place, or in any sign upon any street, sidewalk or public ground, or in any handbill or advertisement or handbill exhibited or carried in any street or public ground, or upon any sidewalk, or any banner or sign flying across the street or from any house, an advertisement of any sort, regarding merchandise, securities, service, or anything so offered to the the public which advertisement contains assertion, representation, or statement which is untrue, deceptive or misleading, shall be fined not less than twenty-five ($25.00) nor more than two hundred ($200.00) dollars for each offense."

All of this contributed to the publicity campaign.

The groups against whom we operated were: The advertising physicians such as Professor Ehrlich, Dr. Edward N. Flint, Dr. J. W. Hodgens, Dr. Howe & Co., Dr. Sweany, Dr. L. E. Zins, Dr. Code, Dr. Wells & Co., Dr. Lawhon and the Atomo-Radio Company, Dr. Sigmund Hirschfeld, Drs. Kennedy & Kennedy, Dr. S. R. Charles, Dr. C. C. Miller, Dr. H. P. Wilkins; the physicians who used drug stores and museums as steerers and cappers and the physicians who make circuits of towns in the country contiguous to Chicago. Amongst these were Dr. Fruth, Dr. Shallenberger, Dr. Walton, Dr. Van Doren, Dr. Piper, Dr. Carson, Dr. Guthrie and Dr. Gable.

These series of articles began October 28, 1913. Most of them have been reprinted and issued as a book entitled "Men's Specialist Frauds, The Methods Used by Quacks in Swindling their Victims." At the present time an out-and-out quack cannot advertise in Chicago except by handbills. We understand that two of the group driven out by the *Tribune*, Drs. Ross and Hodgens, are back. How they will get publicity remains to be seen.

This was the cheapest and most effective campaign ever conducted by the *Tribune*.

In our opinion the situation is not permanently cured. For a permanent cure several radical changes in the customs of our people are required. First, the people must be educated to the point where they cannot be deceived by the lying statements of an ignoramus. If you will allow your mind to run back you will remember that a few years ago the quacks occupied every field of medicine. They have abandoned all but a few fields. The reason why they abandoned these fields was because they became unprofitable. They became unprofitable because of the general education of the people.

Second, the medical profession must change its customs. They must drug less. They must talk less about medicinal cures, specifics, etc. They must combat the idea that because it comes out of a bottle it is good for one; that every disease has a cure if one only could find it. They must convince the people that the function of the physician is not to dope but to guide, counsel, direct and control.

The one great field for quackery now remaining is venereal disease—the practitioners known as men's specialists. When we have educated the people about varicocele, hydrocele, prostatic troubles and venereal diseases, there will be permanent cure of the quack evil. The remedy needs plain speaking.

CO-OPERATION AND CO-ORDINATION OF VOLUNTARY PUBLIC HEALTH ORGANIZATIONS.

FREDERICK R. GREEN, M. D.,
Chicago, Ill.

Read before the General Sessions, American Public Health Association, Jacksonville, Fla., December 4, 1914.

It is difficult to generalize accurately on situations in which one is an active participant. Personal prejudices, unessential and accidental details and limitations of personal viewpoints combine to render contemporary judgment uncertain. Active participants in any movement are engrossed with the administration of details and influenced by their personal and official relations. For them to isolate themselves and their own interests from the situation and to reduce it to general and impersonal terms, requires a mental detachment difficult of accomplishment. Yet it is only by such a process that the value and direction of any widespread movement can be accurately estimated. Let us endeavor to state in as broad terms as possible the existing situation in the present campaign for the improvement of public health conditions and see what deductions can be drawn therefrom.

The epoch-making change in our knowledge of disease has been so often stated as to be commonplace. Yet the inevitable and equally important change which such progress has already made and will make in the future, in professional and social conditions, is only beginning to be appreciated. Up to the time of Louis Pasteur, in the latter half of the last century, with the exception of Jenner's accidental discovery of vaccination, the human race had been, throughout its entire history, without knowledge or ability by which it could control, to say nothing of preventing, epidemics which for ages had scourged and decimated mankind. History records the enormous losses caused by diseases which were then unavoidable and uncontrollable but which we now know can be prevented. The historian of future generations will regard the 19th century as noteworthy, not on account of the rise of democracy, the development of machinery, the discovery and utilizing of natural forces such as electricity, but rather because of those discoveries by which health and long life have become purchasable commodities, which mankind can buy in the same way that he buys food and clothing. Today, this fact is recognized by our leading sanitarians and hygienists. It has not yet even penetrated the popular mind and I doubt whether its enormous economic and social importance and possibilities have as yet been fully realized by any one.

If the importance of the fundamental facts has not been appreciated, it is hardly surprising that the machinery for applying these facts, *i. e.*, organizations interested in public health, should not be coördinated or that much confusion should exist as to the best methods for utilizing the increasing knowledge in this field. The cry today, in all lines of effort, is for organization, for such arrangement and distribution of responsibilities and activities as will produce the largest result with the smallest amount of machinery and expenditure. The prevention of disease and the conservation of human life is clearly too great a task for individual effort. Some form of social machinery is an obvious necessity. If our conceptions of present conditions and future possibilities are vague, it is not strange that the organizations and methods by which this knowledge is to be utilized should be equally vague, largely accidental in origin and based on temporary needs and considerations rather than on any broad principles or critical analysis of the situation. It is significant and I think it must be admitted to be confirmatory of this criticism that, so far as I am aware, in the forty years which cover the development of existing public health machinery and efforts, no attempt has been made to consider the field in its entirety or to ask, "What is the most effective plan which can be devised to meet present and future necessities?" Yet all will admit that, sooner or later, such an inquiry must be made and such a plan must be formulated.

The methods which have so far been developed for improving public health conditions naturally divide themselves into three general classes: namely, official, social and individual. Official and individual efforts may, for our present discussion, be disregarded. The second factor, that of voluntary social organizations, is of the utmost importance, both for the present and the future. Yet it has heretofore been considered in detail rather than as a comprehensive movement and as a matter of individual organizations rather than as a concrete force. It is to this particular field that I invite your attention.

The American Medical Association has been in existence since 1847. Its constructive work, however, is largely confined to the last ten years. Prior to that time, for reasons which are now well recognized, its activities consisted in holding annual meetings and passing occasional resolutions. While its moral influence was no doubt of great value and by no means to be underestimated, it was not until the development of the JOURNAL, under the able editorship and management of Dr. George H. Simmons, that the Association found itself in a position to finance definite undertakings. The different projects which it has taken up since 1905 are familiar to all of you. In 1910, the development of the Association justified the establishment of a definite body, the Council on Health and Public Instruction, charged with the duty of representing the Association before the public and of studying the public health situation as a social phenomenon. During the four years in which the Council has been in existence, it has given careful consideration to the question of its exact function and mission. Obviously, any effort to duplicate the work of existing organizations or to compete with national, state or municipal boards or with existing societies would only add confusion to the present situation. If the Council has any justification for its existence, it must lie in the development of a field of activity entirely distinct from that of existing organizations. It has seemed to the Council that its mission lay in the establishment of a focus around which other activities could be grouped and through which they could be coördinated, by which material and information of all kinds could be collected and through which, so far as possible, isolated forces could be brought into communication with each other. Before making any definite plans, it seemed advisable to the Council to ascertain what was already being done in the public health field. Accordingly a careful study of the public health work of federal, state and municipal bodies and of independent social organizations, has been undertaken, to learn what is actually being accomplished in each of these fields; how much it is costing; who is paying for it; how much duplication exists; what are the needs of each of the units; and how their efforts can be coördinated.

These plans are too recent to make it possible to state the results. Plans are now under way for a survey of federal and municipal public health activities. During the last year, a personal survey of the state boards of health and their work had been made by one of the members of this Association, acting as the special representative of the Council. His report will, it is hoped, throw considerable light on this field.

The remaining division, that of voluntary organizations interested in public health improvement, has been under consideration for two years past. In October, 1912, the Secretary of the Council made the following recommendation:

"Increased interest in public health and increased efforts to improve sanitary conditions have led to the organization of many societies and bodies interested in special phases of the public health campaign. There is danger of present interest leading to overorganization and overdevelopment of unnecessary societies with overlapping and interfering functions leading to the duplication of machinery, the incurring of unnecessary expense and confusion in the public mind as to the relation between different organizations interested in this campaign. The Secretary suggests that the Council consider the advisability of calling a conference of executive officers of the leading organizations in this field to discuss mutual coöperation and proper division of the field with the elimination of unnecessary organizations, if such exist, and the consideration of plans to coördinate necessary organizations and to discourage the creation of unnecessary ones."

At the same time, the Secretary submitted a list of 18 organizations which should be invited to such a conference. The Council approving of this suggestion, correspondence with the executive officers of these organizations was taken up with the result that the list rapidly increased to 50. A conference of executive officers was called at the headquarters of the American Association for Labor Legislation on April 12, 1913, to which 39 organizations sent representatives. After an exhaustive discussion, in which the need of better organization and coördination was generally admitted, a central committee of 15 was created, to consider the entire question of public health activities through voluntary organizations and the ways in which these activities could be improved.

This central committee, of which Mr. John M. Glenn of the Russell Sage Foundation is chairman, met in New York the following June and, after discussion of a number of plans, directed the secretary of the committee to undertake a voluntary survey of the various independent organizations covering their membership, resources, activities and plans. The election of the secretary, Dr. Livingston Farrand, to the presidency of the Colorado State University, postponed this survey until recently, when the committee was fortunate in securing the Secretary of the American Public Health Association as the secretary of the committee under whose direction this study of voluntary organizations has been begun. While the committee is without means and is therefore limited to volunteer services, it is hoped that this survey, limited as it necessarily is, will furnish sufficient facts to justify further study of this field. Any discussion of details of existing organizations must therefore necessarily be deferred until the completion of this inquiry.

But while we are waiting for specific data, certain general considerations and criticisms are worthy of notice. As these criticisms apply, not to individual organizations, but to the field as a whole, a general statement of the existing situation may be illuminating.

Public opinion is the basis of effective legislation. Hence the creation of public opinion is necessarily the first step in any movement. The object of the organizations under discussion is the stimulating and crystallizing of public opinion, with a view to securing the adoption of corrective or restrictive measures. If educated public opinion is necessary in securing ordinary reforms, it is still more so in the public health field. The causes of disease are microscopic and therefore invisible to the eye. They can only be recognized by trained, scientific men. The average man and woman must therefore accept, on faith, the existence of causes invisible to them. This renders public education all the more necessary. It also emphasizes the responsibility of the state and its duty in protecting its citizens from dangers which they themselves cannot recognize. The objects of the organization of these voluntary bodies composed of physicians, philanthropists, sociologists and others interested, are: first, to stimulate scientific study of a particular disease or of a portion of the public health field; and second, to educate and stimulate public sentiment with a view to securing better conditions through the force of public opinion or through the passage of appropriate legislation.

The manner in which these bodies have been organized is much the same. A small number of men and women, especially interested in some particular problem, have become impressed with the necessity of a national organization devoted to their particular subject. A call has been issued for a meeting at which a general program has been presented emphasizing the dangers of the particular disease in question, the need of further study and control, the possibilities and means of suppression, etc. During the enthusiasm engendered by this first meeting, some one has made the customary American proposition to organize a national society. Such a motion generally carries unanimously without opposition or discussion, as any positive and apparently constructive proposal always will in a mass meeting. Officers are elected, constitution and by-laws are adopted. If the cause is a popular one, and if the leaders are energetic, enough money may be obtained to secure the services of an able man or woman as executive secretary and to equip an office. If the membership is limited or the dues are low, then either the part time services of a good man or the whole time services of a mediocre man are secured. If financial support is even more limited, a volunteer executive gives what time he can spare from his own work. In any event, an essential part of the duties of the secretary is the securing of enough new members and renewals of old members each year to get funds enough to keep the society going. Consequently each organization is a competitor with each other organization for members. As those interested in these movements are comparatively few, each organization sends out each year appeals for support to about the same persons, including state and municipal health officers, officers of national, state and local medical organizations and persons known through their connection with other organizations to be interested in such movements. From this limited field each organization secures a certain number of members.

If any doubt exists in your mind as to the situation, ask yourself to how many societies you belong and from how many you have received during the last year circulars, letters and requests for membership.

Of this limited number of persons supporting these movements, a surprisingly large proportion are physicians. As an illustration of the extent to which many of these organizations are supported by physicians, I have had a tabulation made from the last available membership lists of three organizations with the following results:

	Members.	Physicians.	Per cent.
American Society of Sanitary and Moral Prophylaxis	260	194	74.4
American Association for Study and Prevention of Infant Mortality	765	333	44.6
National Association for the Study and Prevention of Tuberculosis	2,034	1,049	51.5
	3,059	1,576	51.5

Not only are from 50 per cent. to 75 per cent. of the membership of these organizations drawn from a single class, but comparison of the membership lists of the leading societies will show that they contain the same names in probably 60 per cent. of their membership. This speaks well for the enthusiasm and unselfishness of these men, but it also means that the present public health movement is being largely supported by a very limited number of people, multiplying themselves in a number of organizations and so producing a membership that is largely fictitious. New organizations naturally turn for support to those persons who have already shown their interest by supporting existing organizations, with the result that each new society practically goes over the same field that its predecessors have canvassed. The burden, both personal and financial, of supporting the increasing number of organizations is constantly becoming heavier. The persons solicited are those of standing, knowledge and experience whose coöperation would be most valuable. They would all gladly support a single representative body, but they cannot belong to and contribute to all.

After the central organization is more or less complete, the society generally proceeds to organize state and local branches. This also seems to be ingrained in our American idea of administration. A few interested persons in each state are asked to take the lead in organizing a state branch. Such a state society naturally has a more limited support than the national organization. It is generally without adequate funds, usually has to rely on a volunteer secretary without facilities for work and in consequence its activities are limited to the two or three days of its annual session and during the rest of the year, it is practically inactive. Each year, an effort is made to stimulate interest, to secure a presentable program, to obtain as large a registration as possible and in general "to make a showing." Yet even in the strongest, best managed and best financed of these national organizations the majority of state branches are practically paper organizations. Even under these conditions, it has been found practically impossible to keep the various state organizations in existence. When one considers the extent to which support has been divided, this is not strange. Still less is it strange that when we come to county or city subdivisions, they are few and far between and are due more to accident than to any systematic plan of organization.

We have, then, an indefinite number of national organizations, each attempting to cover a limited portion of the field, each appealing for support to a limited number of men and women on whom, to an increasing extent, is falling the burden of sustaining these organizations. Each national organization is keeping up an administrative machinery, to the best of its ability, duplicating office work, mailing lists, bulletins, pamphlets and other educational matters and expenses, without regard to what is being done by other organizations. Most of these organizations are trying to develop subordinate state societies although it is perfectly evident that such societies are doomed to failure owing to the inability of the public in any state to support an indefinite number of such organizations. Conventions, congresses, annual meetings and conferences are being held, to such an extent that it is impossible to keep track of them or to read the papers presented before them, to say nothing of supporting all of them or of personally attending the meetings. In addition to all this, there are constantly being sent out proposals for the organization of new societies and appeals to support by membership, subscription, contributions or attendance an increasing number of special organizations working without common leadership, unity of purpose or coöperative plan of campaign.

Specifically then the criticisms which I would make on the existing situation are:

1. The justification and ostensible purpose of these societies are the organization of the public for united effort. This is not being accomplished by present methods. Although the avowed object of all of these organizations is the creation of public sentiment and the education of the people, we have provided for the physician, the sanitarian, the philanthropist and the sociologist, for everyone, in fact, except the average citizen. The existing forces resemble the celebrated regiment to which Mark Twain belonged. They are all officers and there are no privates. For the man or woman who is specially interested in tuberculosis, infant welfare, cancer, school hygiene, correct posture, open air schools or epilepsy, there is a place, provided the individual knows of the special organization on this subject or can be brought in touch with it. But for the man and woman, the housewife and the head of a family, who are or might be interested in public health as a general proposition and in the improvement of conditions under which they and their families must live, there is practically no place. They become confused in trying to determine to which of the many causes presented they shall contribute. The appeal lacks force because it lacks unity. We have divided the public health field up into so many portions that one must practically be a specialist or have special interests in order to find a place. There is no provision for the ordinary citizen. Not only

is support divided, but influence is likewise weakened. Such public sentiment as exists is divided among so many interests as to lack the force which a single united body would have. When an effort is made to use the influence of the organization on the public or on legislative bodies, it too often fails or the influence is minimized by lack of unity.

2. The second criticism, which follows as a corollary of the first, is that multiplication of organizations, each of which seeks to secure its support from practically the same persons, is necessarily self-limited. The number of organizations which a comparatively small number of persons can support is naturally limited. There have lately been sent out circular letters from the headquarters of a recently organized society asking for subscriptions and members. Probably all of you have received these letters. The objects of this organization are commendable in every way, yet they are practically covered by at least three existing societies. Where then is the need of a specific organization to take up a work which could and should be done by one or more already in existence? Special organizations, having a limited appeal and a limited patronage, cannot be multiplied indefinitely. This limit we have probably already reached if not passed.

The attempt to form state and local branches is becoming increasingly difficult, if not impossible. If the field is too restricted to justify an unlimited number of national organizations, the possibilities for state and local organizations must be still more restricted. To expect the public in a single state or a single city to support half a dozen, ten or fifteen special organizations is entirely out of the question. Such a plan cannot fail in the end to be disastrous.

3. The third criticism which can be brought against the existing situation is that although all of these organizations exist for the same general purpose, namely, the prevention of disease, and although their membership is largely composed of the same men and women, yet they have today no common plan of campaign, nor any method by which such a common plan can be devised and executed. We are in the position of an army made up of from fifty to sixty allied forces, each fighting under its own standard and under the orders of its own leaders against the common foe and yet possessing no common plan of campaign nor working in accordance with any definitely formulated program. It is needless to enlarge on this situation. Such a condition can only mean overlapping, duplication, waste effort and lack of efficiency.

4. The fourth criticism is that there exists at present duplication of offices, equipment and expenses, unavoidable under existing conditions. The postage alone on the letters, circulars, papers, bulletins, etc., sent out by these organizations must be enormous. To one office recently came six duplicate letters soliciting membership in a newly formed organization.

Estimate the amount of mail from these different bodies which comes to you in a year and then consider the amount of printing, postage, and clerical work involved. You will realize that the cost is pretty high when compared with the results, and that this is largely due to lack of system and coördination. The principal object sought for by many of these bodies, is to secure results which at the end of the year will enable the secretary or the executive committee to make a report that will justify the existence of the organization. Yet how many of these organizations only succeed in keeping their own machinery going, without any actual output!

5. The fifth criticism is that the duplication and multiplication of organizations has on the public a confusing rather than an educational effect. Newspaper editors are today literally swamped with bulletins and press matter. With the best intentions in the world on the part of those issuing them, these are often contradictory. It is impossible for any newspaper to use all of this material. The editor cannot separate the authoritative and responsible from the spasmodic and incidental. Too often he gives up the task as hopeless and refuses to use any material, where he would be glad to use properly prepared matter from a single authoritative source. The increasing number of conventions, congresses and conferences, the press reports of which are often exaggerated and distorted, further serve to bewilder the newspaper editor and the newspaper reader. Yet the American newspaper today offers the most promising medium for public education on health topics that can be secured, while the growing interest of the newspaper management in this field and the increasing willingness of newspapers to coöperate must be apparent to every one who has followed this subject for any number of years. Authoritative matter from a single central office would be gladly used, but the mass of material at present is such that most of it goes into the waste basket.

Summing up the present situation, there exist today an indefinite number of uncoördinated, unrelated organizations which have originated accidentally rather than in conformity to any plan, which do not provide a place for the general public, which are organized on lines that are necessarily self-limiting and which are financed on a system which is highly expensive in proportion to the results secured. They are at present confusing quite as much as they are educating the newspapers and public opinion. If these are the weaknesses, what are the remedies?

Let it be admitted without question that these various organizations have been created with the most unselfish and public spirited intentions, that the men and women who have organized and maintained them are entitled to great credit for their efforts, that these organizations have each of them been the source of much good. But the plans which have been followed during the past twenty years are now rapidly becoming obsolete.

Public knowledge and interest on all health topics is rapidly increasing. What is needed now is not stimulation so much as wise and definite guidance of the public health movement. The people are interested and are in many cases determined to secure better conditions. They want more information not on single topics but on the entire field. They want advice which shall be expert and authoritative as to what shall be done. The more people that can be enlisted and brought into definite personal contact with the entire movement, the better the results will be. There is great need of a comprehensive, carefully planned and widespread general organization to which all the men and women interested in this subject can belong, in which they can find a place to work, from which they can secure educational material and through which their influence and energies can be systematized and effectively coördinated.

My purpose, therefore, is not one of condemnation of previous conditions. It is rather to raise the question whether the time has not come for the creation of a united, coherent and effectively organized public health body to take the place of or at least to coördinate the independent, accidental and uncorrelated organizations which have so far occupied the field. If anything definite is accomplished in public health reform, it must be through the education of the average man and woman rather than through the efforts of the physician, the specialist or the sociologist. These must indeed act as leaders and furnish the necessary technical information and experience on which successful efforts must rest, but the rank and file of this public health army must be drawn from the public. An ideal organization would be one without limitations as to subject, which any man or woman who desired could join by the payment of a nominal membership fee. A national organization made up of and supported by subordinate state organizations which are in turn composed of local branches is the logical method in this country. But we should substitute for the existing many and weak organizations one strong public health league in each state made up of all classes of citizens. We should appeal to the public to support a public health campaign rather than to ask the public to support separate organizations for each particular phase of public health work. Nor would it be necessary for the special national organizations now in existence to lose their identity in such a body. They could become affiliated organizations or sections of a national organization existing for the purpose of stimulating interest in their special subject and working through the general organization in states and cities rather than through independent organizations of their own. The National Association for the Study and Prevention of Tuberculosis, for instance, could become the Section on Tuberculosis of the American Public Health League, or could remain an independent organization affiliated with the general body as a special society. If it wished to bring some phase of the tuberculosis question to the attention of the public or to issue a special bulletin thereon, this could be sent out through the state and local organizations of the general body. In the same way, material bearing on cancer, sex hygiene, school hygiene, open-air schools, mental hygiene, epilepsy or any of the other numerous subjects on which national organizations now exist, could readily be distributed through the general machinery. The headquarters and offices of such a body would naturally serve as the clearing house for the various allied organizations or sections. Direction of such a National Health League could be lodged in a central board made up of executive officers of representatives of sections or affiliated societies. Such a body could logically take up the much discussed question of the publication of a popular journal or magazine on public health. Under proper editorial and business management backed by the united organizations now in the field and by a new and general public health organization made up of all classes, a monthly journal at a subscription price of one or two dollars a year including membership, could within a short time have a circulation running well up into the hundred thousands. The public interest in and demand for such material is shown by the establishment in an increasing number of newspapers of departments on health as a regular editorial feature.

The accidental, fragmentary and disjointed method which has been followed for the last twenty years should give place to a carefully considered, well worked out, comprehensive plan of organization with the elimination of unnecessary organizations and the discouragement, in the future, of the organization of new and unnecessary bodies. Such a reorganization has already begun in two states. In Minnesota, the State Association for the Study and Prevention of Tuberculosis was merged in a new organization called the Minnesota Public Health Association, which coördinates the State Board of Health, the State University, the State Normal and School system, the newspapers, churches and all other educational bodies in the state. This fusing of resources and support made it possible for them to secure, at once, a full time, salaried, highly trained public health man as executive secretary. In Texas, the same thing has occurred. If all the public health organizations in a state can be united to form a state Public Health Association, why could not all the public health organizations in the United States be united to form an American Public Health Association?

Is it not worth while to consider whether your own organization might not be expanded to meet this demand? You are today the only general public health organization in the field. You have the machinery, the journal, the executive officers. All that is necessary is to expand your plan of organization so as to provide for unlimited, general membership at a low figure, to take steps for the creation of state subordinate branches, to make over your journal into a popular instead of a technical publication and to invite the other voluntary organizations in the field to a conference to discuss the possibility of their becoming sections of the American Public Health Association. We have today a single national organization in the medical profession. Its present prosperity and activities are due entirely to the high grade of its publication and the fact that it is today a necessity for the up-to-date physician. A popular public health journal which would meet a similar demand on the part of the public would have a vastly wider field in that it would appeal to all classes instead of to the members of a single profession. The influence of such a publication on public and legislative opinion would be vastly greater than that of any existing organ and would increase proportionately with its development.

The present method of separate, numerous public health organizations is necessarily self-limiting. Out of the present medley must come some one organization which will dominate the field. Shall it be a newly created organization or an old organization reconstructed? If the latter, which of the existing organizations shall it be? All the conditions point to the American Public Health Association as the one best fitted to fulfill this mission. Is it not possible for your association to become in fact, as well as name, a national public health association for the coördination of all of our voluntary public health activities?

EFFECTS UPON PUBLIC HEALTH AND NATURAL PROSPERITY FROM RURAL DEPOPULATION AND ABNORMAL INCREASE OF CITIES.

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Read before the General Sessions, American Public Health Association, Jacksonville, Fla., December 1, 1914

Not for many years in the history of the American Continent—or indeed of Europe—has the subject of this paper seemed to be more appropriate for discussion than at the present time. Dr. Max Nordau in his work on "Degeneration" written twenty years ago, in comparing conditions existing about 1840 and at the time when he wrote, says, "It is about that date when that generation was born which has witnessed the irruption of new discoveries in every relation of life and thus personally experienced those transformations which are the consequences." Since that time another generation has grown to manhood in the United States and in Canada and urban populations have continued ever to increase as illustrated in the following table:

TABLE SHOWING PER CENT. OF URBAN POPULATION TO TOTAL IN THE UNITED STATES AND CANADA.

	United States.	Canada
1860	16.5%	17.0%
1870	21.0%	18.7%
1880 (4,000)	29.5%	21.3%
1890	36.1%	32.1%
1900	40.5%	37.7%
1910	46.3%	45.1%

It is further probable that a notable proportion of the younger members present in this meeting are a town product and hence cannot fully appreciate the meaning of these figures; but such certainly can understand the urban conditions under which the millions of the poorer people live in the cities where each is engaged in his special public work. That even the best work which many of my co-workers in the Town Planning Association and National Housing Association are doing in the matter of improving the dwellings of the work people is beginning to appear to them palliative or curative rather than preventive is now becoming apparent as seen in the wonderfully rapid evolution of the suburban and Garden City Movement. One does not require to repeat statistics to show that the mortality rates of our cities are higher in the crowded areas and that tuberculosis finds its chief victims in the 80 per cent. of the population commonly spoken of as wage-earners or working people. What I desire especially to emphasize is that which is so hard to measure statistically, viz., the silent but more permanent and far-reaching influences and effects which are the outcome of the intensity of life under modern urban conditions. It would be a matter for wonder if the ordinary city child did possess any particular knowledge of how his food is produced or where it comes from, other than from the corner grocery and brought by the delivery van. The same is true regarding his knowledge of the ordinary facts relating to his constant relations to the world around him; but which are knowledge at first hand to the country child or to the commuter. The earliest and most constant phenomena borne in upon the city child's consciousness are buildings across the street, street cars, elevated tracks, rooms in shadow, noises, as never-ceasing telephones, house bells, cries of newsboys and street hawkers of every sort. Similarly the knowledge set forth in the schoolroom is mostly presentations of facts at second-hand; the real facts for the school child are those of the street-life, viewed in the case of the child of the rich from the detachment of an automobile. Except for the occasional boat trip to some Coney Island for the ordinary city child or the home at the seaside for the children of the rich, it is apparent that the mind of such has in a very peculiar sense been deprived of opportunities for growth under conditions where the objects, which produce impressions upon the eye and ear and other senses are those natural ones which were the educative basis of a previous generation. It will be remembered that within thirty years this change has extended from 25 per cent. to 50 per cent. of the total population of the United States and Canada or to more than 30,000,000 people. It will further be realized, as we think of the matter, that the nursery toys or town office fixtures, the busy factory or the darksome workshop of the sweated seamstress, the school primer or the bank ledger and the swift shuttle or the clanking machine are the objects whose reflected outlines create the impressions which enter into the consciousness and make up the intellectual world of most of this 30,000,000 from childhood to youth and create the permanent characteristics of the mind and form the chief subjects of their interest. Their literature from the daily press to the pictorial magazine never fails to keep repeating stories and pictures until certain modes of thought become permanent; and for good or ill the people of a city or even a nation come to reflect certain types of ideas too often but the echo of the teachings—whether shallow or profound—of some one or more clever writers or else come to be the votaries of some amusement cleverly promoted, whether it be the baseball game or the ubiquitous moving picture show. It will have been observed that in all these modes of building up the intellect and making public opinion very little part, indeed, has been taken by the sanitarian or public health officer, although specialists in special foods and the cure-all advertiser have both been insistently pushing their wares.

It will further have been noted in these illustrations of how the thought and intellect of urban dwellers is largely formed that nothing has been said of the education along economic lines which enters into the process. While there is no city exactly the replica of another in its type of industry, manufacture or trade, yet all have the essentials more or less common of being producers and distributers, varying, however, greatly in proportion. Thus it has been stated that London with its 7,000,000 people has only 638 factories with a total motive horsepower of not more than twice that of the S. S. *Mauretania*, while the 100,000 population of Oldham has spindles enough to turn out yarn for all the weavers of Europe. Perhaps what is even more notable is that of the 45,000,000 people of Britain, 6,000,000 possess half the business capital. It is, indeed, an economic fact that almost seven-eighths of the total urban population everywhere are wage-earners and dependent from day to day upon what is paid to them as producers, after rent, interest and profits have been satisfied. But the reversal of early American economic conditions is not limited to cities alone, since I find that according to the census of 1910 Illinois showed an increase of over 10 per cent. within three decades in rural tenancies or had 41 per cent. of her rural area occupied by tenants. In round numbers, therefore, it may be said that more than 60 per cent. of the total population of all North America is the owner of labor as a commodity to be sold, which if not in demand makes its owner within a few weeks in practice a pauper, since when labor is in excess of demand, especially in cities, its price is fixed at the minimum living-wage standard and, if in demand its owner, through improvidence due to conditions so unusual, too often creates a similar precarious condition.

I have attempted in the foregoing to summarize the processes which have been evident with the growth of cities and which move along with ever-increasing momentum. The phenomena of the routine of daily city life as a part of it are inevitable, necessary and even desirable. The morning paper, the train, the auto, the phone, the dictograph, the hurried lunch, the rush to the train or to the theatre, are all so unlike, for instance, New York at the period when G. W. Curtis's "Prue and I" were building "Castles in Spain" that Rip Van Winkle would indeed rub his eyes if he waked up in the New York of today. The human machine can undoubtedly, if given time, adjust itself to conditions enormously different from what have hitherto been deemed normal; but probably no better evidence of non-adjustment can be given than in the hyper-æsthesia, which that marvellous man, Edison, has developed that prevents him from sleeping more than three hours in twenty-four and which at the same time causes him to enunciate the theory that man need no longer be a sleeping animal;

that speeding up is all that is necessary if properly graduated, and that enormous time will thus be saved to devote to labor. It is curious that it is not seen that all this speeding up is not alone an accumulator of rent, interest and profits at the one end, with a comparative minimizing of home life and distributed profits to the industrial wage-earner at the other; but further in the degree that the wage-earner's work becomes specialized it is the means by which he becomes unalterably and inextricably fixed to Ixion's wheel in the vortex of labor and is helpless as a child, when the wheels cease turning from an overstocking of the market or the financial cataclysm —induced by war.

I have for many years observed the phenomena of abnormal urban increase in modern so-called progressive countries and with many others have tried to interpret their meaning and predicate their results. Today as I am writing this I have had an illustration of the results of the simplest stage of the process. I am covering my rose bushes for the winter and ask my neighbor's part-time furnace man to help me. I find he is living in an old dwelling with leaky roof, rent free, and looking for odd jobs. He tells me he has been in Canada six years, comes from Cheshire, where he was brought up on a farm till he was fifteen, when his parents died and he went to Manchester. He married, has now a wife and four children. For two years in Canada he worked on a dairy farm near Ottawa; then his wife wanted city neighbors and so he moved to Ottawa. When the war broke out he was making $11.00 and paying $4.25 for rent weekly—manifestly within a week without work becoming a pauper. I further recall the events of forty years in the city where I was a student and long resident and today know of almost no prominent wholesale house then doing business, which is in existence today and but few of the sons of the most prominent scholars, physicians or clergymen who have maintained in any degree the position of their fathers. If, however, we examine the situation broadly it does not seem difficult to discover underlying causes, which would seem to account for the widespread results of what we cannot define more exactly than by the term "Degeneration." Dr. Creighton Brown said recently, "The tendency of civilization has been to transfer the burden of breadwinning for the masses of the people from the muscles to the nerves. . . . It is certain that we are more jumpy than we used to be, have to be more on the alert, and so make sharper demands on our nerves, and are prone to those nervous breakdowns that lead to mental disorder. We have been crowding our people into towns, where bustling and nervous agitation are inevitable; we have been bringing up our babies (where we have any) on anything but mother's milk and by the employment of women in many industries have curtailed that family life in which the nervous child best lives and thrives." The notified lunatics of England increased in fifty years by over 262 per cent. while the population increased by only 85 per cent. Dr. F. W. Mott, pathologist to the Asylums Board, London, says, "A neuropathic heredity is the most important cause of insanity. . . . There are two very numerous classes of individuals whose conduct is anti-social and who at present are not registered or controlled. They are first the chronic, incurable inebriate, dangerous to himself and to society and responsible for a large proportion of the crimes of violence; secondly, the higher grade imbecile of feeble-will power, slender sagacity and energy and lack of moral sense. Although the feeble-minded may be met with in all kinds of society, they are especially to be found amongst the submerged denizens of the one-roomed tenements of our cities." Dr. Feré of Paris associates with this feeble-mindedness the great increase of hysteria at the present day, due directly to what he terms the "fatigue of the present generation," while Dr. Lewellys Barker says "that abnormal expressions of emotion or disorders of the will manifesting themselves in abnormalities of conduct" can be evidences of unsoundness of mind. Dr. Charles Dana of the National Committee for Mental Hygiene has estimated that unsoundness of mind in the United States in 1904, as recognized officially or those in institutions for the insane and feeble-minded, cost $60,000,000 annually and the loss in industrial activity $30,000,000 more. These figures, moreover, do not include the criminals and paupers who add so enormously to the public expenditures; but who, as shown by the New York Courts and other charitable institutions, must be included to the extent of at least 50 per cent. under the category of mental defectives.

But one might continue indefinitely, if time permitted, adding yet more sombre shades to the picture already painted in darksome colors. It will have been noticed that in what I have said no reference has been made to what the direct rural losses have been through depopulation. An examination, however, of the Census of 1910 for the older States and Provinces makes it quite evident that the rural losses of the descendants of the old Anglo-Saxon stock even in ten years have been relatively great, and in 40 years have been enormous. Economically speaking the great bulk of them have been transferred from the land-holding class of producers of raw materials to the class of middlemen and of wage-earners; but all in the most exact sense make an addition to the enormous army of dependents upon the energy of organized capital, and play some part in its exploitations whether of *rent*, *interest* or *profits*. How much relatively this organization means may be judged from single figures. In the Province of Ontario, Canada, the Census showed the capital invested in agriculture to be $1,283,000,000 as compared with a total of $1,247,500,000 in manufactures and industries for the whole Dominion of Canada. Alongside these figures may be placed those collected by Professor G. L. King, Ph.D., of Philadelphia, wherein he has pointed out that the consumer pays from 65 per cent to 265 per cent. more than the farmer receives; or New York City consumers pay $645,000,000 for food which at the railway terminal cost only $350,000,000; or the people pay some $200,000,000 for cartage and delivery costs and in retailers' profits. What seems an elementary fact in economics is that it would seem infinitely better, if a very large number of these wage-earners in cities (so absolutely helpless and dependent on the one hand on what capital is prepared to allow them in wages, when rent, interest, and profits have been satisfied and on the other forced to pay, so to speak, at the contractor's store whatever price he chooses to charge for life's necessaries) were living in the country where they could produce at least the necessaries of life for themselves and become in some measure the possessors of physical, mental and moral independence, while at the same time bettering the conditions of life for the dependent toilers of the city. The social isolation of rural life and its initial hardships have long been set down as the chief causes for the depopulation of the country districts; but there is abundant evidence that with the migration of the more ambitious and energetic to the cities to engage in commercial or professional pursuits, the rural communities have suffered so seriously in mental equipment, scientific advancement and business experience, that organized finance,. commanding the railroads and other modes of transport and of distribution to which have often been added the control of coal and other minerals, today dominates absolutely every step from the producer to the consumer.

Remembering the enormous displacement in population where in Canada during the last decade urban population increased 62.5 per cent. and the rural only 17 per cent. with an immigration in ten years equal to one third of the previous population, I have frequently spoken to prominent business men and Boards of Trade regarding the possibility of reversing the process by employing capital now in the hands of individuals or companies in purchasing areas of land and by utilizing business methods make a modern industry of agriculture. I do not remember to have met a single important urban investor or taxpayer, who was prepared to lessen by one individual, the taxpaying consumers of his own city through transferring such bodily to engage in agriculture—an industry, indeed, which he was by no means assured would prove a success. He would, on the other hand, be quite prepared to finance half a dozen *tied* stores in the suburbs, because he was confident that his "man Friday" to save his own dollars would be sure to extract enough from the consumer to at least pay the interest on notes, while the stock would guarantee the principal.

I do not come with any ready-to-hand panacea for a world-wide evil, worse perhaps in undeveloped India or China, where the money-leader in the small villages is even more powerful and paralyzing than our capitalists and financial institutions; but two or three outstanding facts seem to me so direct in their bearing upon the problem that I deem them at least worthy of reference as illustrations of the actual situation. In 1900 the city of Chicago, that part of Cook County, Illinois, not in farms, contained 190,077 acres, which with a population of 1,775,515 gives 8.1 persons per acre. Of course the hundreds of acres included in railroad stations and sidings should be excluded from the house area; but the remarkable fact exists that during the ten years following, only 19,440 acres were added to the city and yet the population increase was 546,074. This means, if the new population were placed on the new area that the density per acre would be 28 or a jump of 300 per cent. over the previous density in 1900. Of course this distribution did not actually so take place; but what did occur was the enormous increase of tenements and apartments, so that there were 8.12 persons to every house in Chicago, and nearly one third increase per acre over a city having 210,117 acres of area. The picture seems to me one easily understood. No figures are given of Chicago real estate values, but the agricultural lands of the state are reported as having increased 96.5 per cent. in value during the decade, although their productiveness per acre had not increased; while absentee landlordism has notably increased and tenancies have proportionately multiplied everywhere whether in country or city. Year by year sees, whether in the United States or Canada in the older districts, the power of capital ever growing and the number of the proletariat ever increasing. From a most unexpected quarter come words, indicating in the most exact way possible, what a scientific observer, for many years separated by his national duties far from our ordinary northern cities, believes to be the essential cause of poverty and unsanitary conditions. Surgeon-General W. E. Gorgas of the Panama Canal Zone has declared out of his own experience that poverty "is the greatest single cause of sad sanitary conditions." The solution in his opinion lies in the adoption of single tax through its effect in eliminating the poverty due to inequitable division of wealth. Sanitation is most needed by the class of people, who would be most benefited by the single tax." How mysteriously the possession of land, whether a million acres in Mexico or a single suburban lot with inflated values, blinds or distorts the vision of every one as to the essential, one might say eternal, principle of land holding, viz., that of *productive occupancy*, and to the logic of taxing the holder of land on unearned increment if holding it unimproved, while the individual, municipality or state makes it valuable through the output of energy in the shape of work or capital expended, need not be dilated upon. To any student of sociology, who will analyze the social and economic phenomena within even his own personal range of experience it must be evident that while the amenities of life in every day society seem to be ever increasing, yet as a matter of fact the machine of what is called the *competitive system in a capitalistic age* is today so complete, operated so delicately and well by the most highly trained technicians that the ordinary artisan or workman, but a cog in the wheels, goes on playing his part mechanically, almost unconsciously, hypnotized by the rhythmic hum of the wheels; but awakened suddenly to the real situation through some natural or economic catastrophe, he too often finds himself a helpless supernumerary among the unemployed, absolutely lacking in any independent resources or means of even a simple subsistence. Death-rates may fall through the application of now well-understood sanitary and scientific methods against the contagious diseases, the maternity nurse may soothe the brow of even the most helpless victim of the system in the slum, perhaps made tidy by the inspector; but the human wrong will continue until somehow, somewhere and sometime the daughter of the horse-leech with her cry:—Give, give, give! is forcibly or, if need be rudely, stopped from taking her toll of rent, interest, and profits growing out of the anomalies of our land system and of its congener, viz.:

How real is the necessity for education along ethical lines may be judged from a closing paragraph in the Third Annual Report of the Philadelphia Housing Commission:

"The more conditions improve, the greater the difficulty, but the more imperative the duty to do this work. What is won can only be retained by protective measures. Thus in Philadelphia, with the development of the city as it has been going on, certain definite causes stand out as responsible for communal defects. These causes are continually active and cannot be controlled unless, for example, a zoning system is established, regulating the occupancy of residential areas and also the changes in the uses to which buildings are put, so that a well-established home district cannot be depreciated in value nor transformed as to its desirability by the incoming of an undesirable trade.

"Again, the system of taxation has a direct effect upon the building of homes and home ownership. Some changes need to be introduced that will more equitably distribute the assessment and tax levy. Moreover, it is not at all inconceivable that a preferential system of taxes may be necessary in order to stimulate ownership and retention of homes by the small wage-earning class. It may be advisable also for the municipality to create loans similar to the plan of the continental cities, to enable the wage-earner to borrow at low rates funds to provide himself with a home. Especially is it true that, where conditions exist that were once legal but, owing to a better knowledge of sanitation, with its attendant law, now are illegal, municipal loans should also be made available to enable the home owners to make the improvements with money borrowed from the city, the repayment of which can be scattered over a period of years and collected as are taxes."

The idea that capital can exist, pursue its way and prosper without the coöperation of that labor, which called it into being, indeed, fondled and nursed it into adolescence and full grown maturity. Too often has capital been proved to be a veritable Gargantua of insatiable appetite slowly immolating his victims; while my studies have led me to conclude that it will be impossible to prevent international wars from being called into being at the will of the Armament Trust and its parasitic underlings and that ordinary commercial business will not be conducted either morally or with due consideration for the rights of the weak if the principle enunciated in America of "taking all that the traffic can bear" be accepted as an economic necessity. Never, indeed, can the simplest yet most difficult of all commandments, "Do unto others as ye would that others do unto you," become in any degree obeyed nor the ills of society be greatly ameliorated, much less removed, until *land*, *labor* and *capital* be bound together in a bond of love, greater than any sworn oath to ever love, honor and obey one another: Then and then only, shall be fulfilled, the highest law, the law of Christ!

THE USE OF A MICROSCOPE IN THE DIAGNOSIS OF PELLAGRA.

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It is very rare that one finds a typical case of pellagra. It is a disease of many symptoms and of many variations. It may be placed in the sphere of dermatology, neurology and gastrology, but still it is a general disease. It spreads and is not considered contagious, but infectious it must be. It has the latitude of amœbic dysentery and hookworm disease and yet the treatments for these diseases have little effect. Is the microscope of value in the diagnosis of the disease?

For two and a half years I have been more or less interested in intestinal bacteria, but the intestinal bacterial and protozoal flora include so many species I have looked with doubt on the pathogenicity of any of them until it is definitely proven. In addition to the colon group of bacteria which are found in feces of pellagrins, I have, for many months, noticed with much interest a bacillus which may be the cause of pellagra.

This bacillus is much longer and more sharpened at the ends than those of the colon group. It is motile, ærobic, sporogenous, stains readily and grows on culture media. When spore formation is about to occur in the bacillus a point of cloudiness or an area of bright refraction appears in the protoplasm and the cell generally elongates. The spore enlarges, the cell membrane bursts and the young bacillus emerges through the opening. At first the bacillus is very active and takes the form of a spirillum for a few seconds. It then elongates and becomes less and less motile. Later it may appear rod-shaped, slightly curved or as a long undulating thread.

Animal inoculation experiments have not been very successful. Mild intestinal affection was produced in a cat and the bacillus was again observed on microscopic examination. In a man pellagra has been induced by transference of cultures of the bacilli. Pharyngitis and bronchitis developed within three days and was soon followed by definite intestinal and nervous symptoms of pellagra. The microscope revealed the organism in its many forms.

Of the fifty-three cases of pellagra examined, the bacilli were seen in great numbers. Seventeen of these have been examined many times and the organism was present in every instance for many months. The organism has not been seen on examination of healthy individuals and those suffering from other diseases.

The bacillus in culture has been tested by many drugs. A one per cent. solution of ichthyol seemed to have a most decided effect. I have partially tested this drug on fifteen cases of pellagra within the last six weeks. One or two five-grain pills three times a day for eight or ten days apparently cures the average case. In two instances I have known forty grains of the drug to relieve all digestive and nervous symptoms. The more advanced cases require longer treatment. In so short a time it is impossible to test the drug thoroughly but it seems to act as a specific. With the symptoms, the bacilli disappear.

The organisms in all stages of the disease are present in enormous numbers in the contents of the large intestine. I believe it is usually confined to this situation. Its deleterious effects upon the body appear to be largely due to the production of toxic substances which in addition to serious intestinal irritation or lesion may on absorption incite those systemic disturbances which characterize the toxæmia. The disease must be spread by direct contact with the excrement of those afflicted with the malady or by flies conveying the parasites to articles of food.

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CHEMICAL DISINFECTION OF EXCRETA.

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Read before the Laboratory Section, American Public Health Association, Jacksonville, Fla., December 1, 1914.

The objections of the privy system which now prevails in rural districts, and too often, be it said, in cities, are recognized by all. The evil consequences that may follow the present methods of disposal of "night soil," where there is no proper sewerage system, are apparent to physicians and sanitarians and, I am glad to say, to a great number of people in general.

Yet the privy which contaminates the air and soil, pollutes the water, poisons wells and causes disease and death, has been generally accepted as a necessary evil, even by people accustomed to the comforts and privacy of a water closet in a city, and who desire to have an equivalent in the country, and efforts to provide a substitute have been considered of little avail in many communities. Even health officials charged with the safeguarding of the lives of the people have, in many instances, deemed it sufficient to direct that the privy be not located within fifty feet of a well or spring, and that there be a frequent removal of excreta.

In recent years, however, there has been a change of sentiment on the part of many people, and state and local health authorities have been beset with inquiries as to substitutes for the present death-dealing privy vault. This, no doubt, has been brought about, to a considerable extent, by the dissemination of information on the septic tank process of purification of sewerage. Still, there is good reason to believe that the campaign against the typhoid fly conducted with such vigor within the past decade, and the education on prevention of hookworm disease, have had much to do with the awakening of the people.

Two types of sanitary privies are generally recognized, namely, the so-called "dry system" and the so-called "wet system."

The objections of the present day, "wet and dry system," however, have been so ably described by Doctors Lumsden, Roberts and Stiles, in a Bulletin of the United States Public Health Service, issued in February, 1911, that I will not enter into the details here, but will simply explain to you the results of an investigation extended over the last twelve months with a type of sanitary closet which is marketed commercially and which will decrease the disadvantages, and at the same time increase the advantages connected with the older type of outhouse.

The apparatus is a well-made and handsomely designed cabinet which conceals a strongly built tank of twenty-four gauge steel, heavily galvanized.

The tank should contain about three inches of water to which is added a germicide specially adopted for this purpose and being guaranteed to possess a Hygienic Laboratory Phenol Coefficient of 9 to 10.

The covers of these closets are so fitted as to make them practically air-tight. The lower member of the lid overlaps on the side of the cabinet, and the upper member of the lid is fitted with a rubber cushion projection, which, when closed, fits snugly into the shaped seat-hole.

The air enters into the cabinet at the bottom through air intakes, circulates around the containing tank and escapes, carrying with it every vestige of odor through a four-inch vent pipe which passes on to the chimney.

The practical working of this closet is most simple and free from objectionable odors and the emptying of the tank can be done intermittently by means of a pump attachment or by continuous flow if found desirable. The closet can also be provided with an automatic mixing arrangement so that the contents are thoroughly mixed each time the closet is used or with an automatic appliance discharging a new supply of disinfectant, approximately one quarter ounce of a 10 per cent. solution of the disinfecting fluid mentioned above, being added each time the closet is used.

In the following charts the results of the germicidal action of the disinfectant used are indicated for a closet with the automatic attachment and for a closet without the automatic attachment. Each experiment was carried out at the same time on two closets, one called "Test Closet" and the other "Control Closet," each closet being used by a squad of six men each for a period of from three to four weeks. In the "Control Closet" only water was used, while the "Test Closet" contained at the beginning of the experiment a 2 per cent. solution of the disinfecting fluid mentioned above equal in volume to the water in the "Control Closet."

Chart No. 1 represents the results on "Test and Control Closets" with automatic attachments such as mixer, supply tank, and discharging pump and was in use from June 15 to July 21, each closet being used by a squad of the same six men during the whole period. Samples were taken from the closets on June 25, July 2 and July 21, representing seven, fourteen and twenty-eight days' actual use, respectively (Saturday afternoons and Sundays, being holidays, are not counted). On each of these dates two samples were taken from each closet, one from the inside and one from the pump. Care was taken throughout to treat each sample in exactly the same way so that the results might be truly comparable.

During the period of the test the following deposits were made:

Test Closet	excreta, 67; urine, 170.
Control Closet	excreta, 117; urine, 234.

It should be noted that at no time during the test did the test closet contain an appreciable amount of solid material, only a few pieces of formed stools being present at any time. On the other hand, the control closet contained at all times during the test a large amount of solid material consisting of large well-formed stools and paper. This confirms the fact that the disinfecting fluid has a decided disintegrating action upon fecal material.

BACTERIOLOGICAL EXAMINATION.

Closet.	Sample.	Date.	Colonies per cc.				B. coli per cc.
			Infusion Agar 48 hrs. at 37°C.	Infusion Agar 5 days at 20°C.	Litmus 48 hrs.	Lactose Agar at 37°C.	
					Total.	Red.	
Test	No. 1 Inside	6-23-14	160	200	160	0	0
Test	No. 2 Pump	6-23-14	140	200	110	0	0
Test	No. 5 Inside	7- 2-14	90	120	100	0	0
Test	No. 6 Pump	7- 2-14	80	100	100	0	0
Test	No. 10 Inside	7-21-14	400	160	180	0	0
Test	No. 10 Pump	7-21-14	300	120	160	0	0
C'trol	No. 3 Inside	6-23-14	92,000,000	74,000,000	81,000,000	466,000,000	18,000,000
C'trol	No. 3 Pump	6-23-14	71,000,000	53,000,000	75,000,000	41,000,000	19,000,000
C'trol	No. 7 Inside	7- 2-14	130,000,000	120,000,000	190,000,000	120,000,000	90,000,000
C'trol	No. 8 Pump	7- 2-14	190,000,000	160,000,000	110,000,000	90,000,000	60,000,000
C'trol	No. 11 Inside	7-21-14	11,000,000	22,000,000	9,000,000	6,000,000	4,000,000
C'trol	No. 12 Pump	7 21-14	8,000,000	16,000,000	6,000,000	4,000,000	2,500,000

CHART No. 1.

The results of the test are entirely satisfactory. The fluid contents of the test closet might have been disposed of at any time in any manner esthetically acceptable, and would not possibly become a menace to health.

Chart No. 2 represents Test and Control Closet of plain simple construction, no provision being used for the automatic mixing of the contents or for the addition of new supplies of disinfectant. Each closet was used by a squad of the same six men from August 24 until September 25 when samples were taken from each closet, both before and after thorough mixing. The closets were then allowed to stand without use until the morning of September 28 when the contents were again sampled. During the period of the test the following deposits were made in the closets:

Test Closet......................excreta, 86; urine, 210.
Control Closet..................excreta, 71; urine, 273.

It will be noted that in each case the unmixed samples from the test closet show very satisfactory results. The results on the mixed sample

BACTERIOLOGICAL EXAMINATION.

Closet.	Sample.	Date.	Colonies per cc.				B. coli per cc.
			Agar 48 hrs. at 37° C.	Agar 5 days at 20° C.	Litmus 48 hrs. Total.	Lactose Agar at 37° C. Red.	
Test	Not mixed	9–25–14	1,500	3,000	1,700	1,700	6
Test	Mixed	9–25–14	32,000	22,000	42,000	42.000	5,600
Test	Not mixed	9–28–14	600	600	550	550	0
Test	Mixed	9–28–14	450	500	390	390	0
C'trol	Not Mixed	9–25–14	16,000,000	18,000,000	10,000,000	2,000,000	1,200,000
C'trol	Mixed	9–25–14	154,000,000	100,000,000	131,000,000	16,000,000	8,000,000
C'trol	Not mixed	9–28–14	140,000,000	170,000,000	154,000,000	54,000,000	42,000,000
C'trol	Mixed	9–28–14	160,000,000	150.000,000	131.000.000	37,000,000	28,000,000

CHART No. 2.

taken from the test closet on September 25 are not as satisfactory as might be desired. However, when the contents were allowed to stand for seventy-two hours, the bacterial counts, both on the mixed and unmixed samples, show a very complete and satisfactory degree of disinfection, such as would render the contents entirely non-injurious to health.

Chart No. 3 represents Test and Control Closet in use from September 29 to October 27 in which was used Commercial Formalin as a disinfectant.

The details of this test were precisely the same as in those mentioned above. The closets were of simple construction, no special attachments of any kind being provided. At the beginning of this experiment, one closet contained six gallons of a 1 per cent. solution of Commercial Formalin; the other closet a like column of a 2 per cent. solution of Commercial Formalin. As a control closet, containing water only, had been used so often in previous tests, it was not considered necessary to include such a closet in this experiment.

Each closet was used by a squad of six men and, during the period of the test, the following deposits were made:

Closet No. 1, 1 per cent. Formalin.......excreta, 88; urine, 274.
Closet No. 2, 2 per cent. Formalin.......excreta, 86; urine, 343.

Samples were collected from the closets on October 8, October 19, and October 27, representing one, two and three weeks of actual use respectively. In every instance two samples were taken from each closet, one before and one after thorough mixing. The bacteriological results are shown in the following tabulation:

BACTERIOLOGICAL RESULTS.

Closet.	Sample.	Date.	Colonies per cc.				B. coli per cc.
			Agar 48 hrs. at 37° C.	Agar 5 days at 20° C.	Litmus 48 hrs.	Lactose Agar at 37° C.	
					Total.	Red.	
No. 1							
Formalin	Not mixed	10- 8-14	30,000	30,000	31,000	21,000	16,000
Formalin	Mixed	10- 8-14	1,510,000	690,000	700,000	600,000	380,000
Formalin	Not mixed	10-19-14	10,000	12,000	14,000	9,000	6,000
Formalin	Mixed	10-19-14	1,800,000	1,200,000	1,300,000	890,000	580,000
Formalin	Not mixed	10-27-14	1,340,000	2,600,000	1,900,000	980,000	620,000
Formalin	Mixed	10-27-14	62,000,000	59,000,000	48,000,000	27,000,000	19,000,000
No. 2							
Formalin	Not mixed	10- 8-14	5,000	6,000	1,400	0	0
Formalin	Mixed	10- 8-14	127,000	99,000	170,000	120,000	65,000
Formalin	Not mixed	10-19-14	2,000	3,400	1,800	0	0
Formalin	Mixed	10-19-14	230,000	390,000	280,000	190,000	96,000
Formalin	Not mixed	10-27-14	12,000,000	10,000,000	9,000,000	8,000,000	4,500,000
Formalin	Mixed	10-27-14	92,000,000	112,000,000	68,000,000	47,000,000	29,000,000

CHART No. 3.

The results with the 1 per cent. solution of Formalin show in no case a satisfactory degree of disinfection. With the 2 per cent. solution the results with the unmixed samples are fairly good for the first two weeks, while the reverse is true with the mixed samples, showing that the Formalin does not have the power to penetrate masses of fecal material. The samples for the third week show results nearly, if not fully as bad as might be expected with a closet in which water only had been used. This would indicate that the Formalin solution is quickly exhausted.

It is worthy of note that from the microscopic appearance of the contents of these closets a solution of Formalin has a much less disintegrating action upon fecal material than water alone. This view is also borne out by the bacteriological results.

In conclusion it may be said, that in the strength used and under the conditions of this test Formalin can not be considered as a safe and satisfactory disinfecting agent for fecal material.

It might be of interest to mention that further work will be continued to investigate the action of the disinfection of hookworm larvæ and eggs and if possible on other organisms of parasitic origin, by means of the same type of sanitary closet and disinfectant as described above.

REPORT OF THE COMMITTEE ON STANDARD METHODS FOR BACTERIAL MILK ANALYSIS.

Presented to the Laboratory Section, American Public Health Association, Jacksonville, Fla., December 2, 1914.

To the Officers and Members of the Laboratory Section of the American Public Health Association.

Your committee, to which was referred the revision of standard laboratory methods for the examination of milk, beg to report that they have made a canvass of the situation and in view of certain extensive and important experiments which are now under way they deem it unwise at the present time to recommend any decided changes in the report of the former committee, but advise that this be retained until the completion of the above-mentioned experiments, with the following exceptions.

It is recommended that pending the formulation of a more complete report the following methods be adopted as a working basis:

First: The standard methods at present do not specify whether the counting of plates should be done with the naked eye or the lens. It is proposed that the counting should be done with a lens of 3½ diameters magnification.*

Second: The standard methods specify 1 per cent. of agar, not saying whether dried or ordinary agar is meant. It is proposed to substitute for this 1.2 per cent. dry agar or 1.5 per cent. ordinary agar.

Third: The use of beef extract 0.5 per cent. instead of infusion of fresh meat. Liebig's extract shall be used when possible.

Fourth: The standard methods fix the reaction at 1.5+. It is proposed to reduce this to 1 in order to make the reaction of culture media conform more closely to the normal reaction of milk.

Fifth: All plates are to be incubated at 37° C. and counted at the end of 48 hours.

The committee asks for a continuance.

Respectfully submitted,

MAZŸCK P. RAVENEL,
Chairman.

Agreed to by
H. W. CONN,
W. H. PARK,
B. H. STONE,
WM. ROYAL STOKES.

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* The *Engraver's Lens* No. [illegible], made by Bausch & Lomb, fills the requirements and is a convenient lens for the purpose.

BOOK REVIEWS.

A Manual of Practical Hygiene. *For Students, Physicians and Health Officers. By Charles Harrington, M. D., late Professor of Hygiene in the Medical School of Harvard University. Fifth edition, revised and enlarged by Mark W. Richardson, M. D., Secretary to the State Board of Health of Massachusetts, in collaboration with the following officials connected with the Massachusetts State Board of Health: W. H. Clark, Chief Chemist; X. H. Goodnough, Chief Engineer; William C. Hanson, M. D., Assistant to the Secretary; Hermann C. Lythgoe, Chief Analyst of Food and Drug Department, and George H. Martin, formerly Secretary to the Massachusetts State Board of Education. Octavo, 933 pages, 125 engravings and 24 plates on colors and monochrome. Cloth, $5.00, net. Lea & Febiger, Publishers, Philadelphia and New York, 1914.*

In the 900 pages of the Fifth Edition of Harrington's "Practical Hygiene," carefully edited by Dr. M. W. Richardson, will be found set forth much of the most up-to-date information on the subject of Sanitary Science. As stated in the preface, the subject "has now become so large that it cannot be adequately encompassed by any single writer," and properly the editor has associated with him expert specialists, who have prepared different chapters.

The impression gained from a perusal of the work is that it would perhaps have been better called a "Text-Book on Sanitary Science," since many of the subjects are treated rather from the standpoint of the student than of the health officer. To take but one or two examples, the subject of meat inspection may be referred to. Some 270 pages in Chapter I are devoted to foods and yet only two pages are given to "Meat Inspection." When this is compared with Chapter V of the work of Endelmann of Dresden in which "Organization and Methods of Procedure of the Inspection Force" dealing with the details of ante-mortem and post-mortem inspection are given in detail we realize how lacking the chapter is in just the information which an officer of health is looking for. What to look for and how to look for it are especially what the health officer seeks for in a work on Hygiene. To take but one other example in the section on Food Preservation, only half a page is devoted to conservation by cold, although almost every state and the Federal Government have or are passing laws regulating a business in which millions of dollars are invested and which has much more to do with the public health than parasitic diseases to which a number of pages are devoted.

Chapter II is devoted to "Air" and gives the usual chemistry and physics of air. Considerable space is given to aqueous vapor in air; but the part it plays in the hygiene of dwellings is dealt with under Ventilation and Heating. We could have wished for something much more extended as a definite outline of modern methods of supplying the much needed moisture to dwellings in northern climates where with hot-air and hot-water furnaces in close-shut houses the relative humidity often scarcely exceeds 25 per cent. Accurate illustrations might surely have been given of some such apparatus, when some twenty pages are given up largely to different diagrams of plumbing fixtures, illustrating the same applied principles.

Chapter V deals with "Disposal of Sewage." It is an admirable outline of the subject and deserves in keeping with its importance more space than has been given it, if comparison be made with other overgrown chapters. What is remarkable, in view of the fact that in America by far the larger number of people live in villages and country places where no sewerage systems exist, is that one sentence alone refers to any simple method for disposing of waterborne sewage in unsewered districts, and we are left, as our sole resource, only the ancient cesspool. In view of the needs of private houses and institutions, where windmills and other engines supply adequate water for a plumbing system, surely it would have added to the value of the chapter if an outline of the construction and management of a small septic tank with intermittent discharge and sub-surface tiles had been given.

Chapter VI is another rather disappointing chapter. There is no one subject which gives the health department of a city more trouble and none whose importance is more generally recognized than the disposal of refuse, yet it receives only four pages while plumbing receives nearly forty. The health officer seeking for information and guidance does not get from the chapter such practical aid as he is entitled to in a work on practical hygiene.

Having said so much in criticism of the work as being in our view ill-balanced in the space devoted to different subjects, we turn to such a comprehensive and admirable chapter as that on "Water." It is a compendium rather than a chapter. The statements in the section dealing with mineral matters as producing goitre must, however, in view of recent studies, be considered antiquated and apocryphal. The sections dealing with the examination of water are very complete.

Chapter X deals with occupations and has much interesting information in it. It is certain, however, that the working factory inspector will sigh for details of practical methods for carrying out his work, such as those given in the chapter on "Water."

Chapter XI on "Medical Inspection of Schools" is admirable and in every respect up to date.

Chapter XII deals with "Military Hygiene" and at the present time is full of interest.

Chapter XV deals with "Infection, Susceptibility and Immunity." The student of preventive medicine or the practising medical officer cannot become too thoroughly saturated with these subjects, since they deal with principles underlying the phenomena brought about under the many insanitary conditions referred to in other chapters. In the work of vaccination and immunization as against smallpox and typhoid the medical officer must be in every way *en rapport* with the most recent teachings of medical science if he is to take early action to suppress conditions which may rapidly develop into serious outbreaks.

Chapter XVI dealing with "Insects and Human Disease" is timely and adequate.

Chapters XVII to XX dealing with "Quarantine, Control of Outbreaks of Communicable Diseases, Vital Statistics and Disposal of the Dead" are concise and up to date. The work as a whole has material of great value in it; but like most works dealing with so wide a subject must necessarily be judged differently by reviewers in the degree that they look upon matters from diverging points of view—whether from the academic or from the practical.

P. H. Bryce.

Food Products. *By Henry C. Sherman, Ph. D., Professor of Food Chemistry, Columbia University. Macmillan Co., New York. $2.25.*

The increased cost of living has aroused a full cry for more light on the fundamental problem of food supply. This extensive and complete work of Dr. Sherman is the product of keen observation, scientific research, and lucid interpretation of a mass of data which has rapidly accumulated with the progressive changes in methods of production, manufacture and sanitary control of foods. The laboratories of the United States Government and of the universities are yielding rich store of chemical and nutritional knowledge which is here brought up to date, well organized and interpreted in scientific terms. Students of the universities, physicians, social welfare workers, dietetians and homemakers will find here a thorough survey of the constituents and functions of foods, food legislation, the complete story of milk and its products, eggs, meat, poultry, fish, grain products, vegetables, edible fats and oils, sugars, and food adjuncts which will make the selection, care and utilization of food products an act of knowledge instead of, as so frequently happens, an act of faith. The topical bibliography will open a mine of information to those whose whetted interest would carry them on. The publication of this valuable book at this psychological hour is of basic importance to every student of social economy.

Laura A. Cauble.

Vivisection and Medical Progress. *Animal Experimentation and Medical Progress. By William Williams Keene, M. D., LL. D. Houghton Mifflin Co., New York and Boston.*

Few physicians have had the opportunity to witness the development of modern antiseptic surgery and animal experimentation which has been afforded to Dr. William Williams Keene, Professor Emeritus of Surgery of the Jefferson Medical College in Philadelphia. Beginning his career in 1862, during the troublesome times of the Civil War, he has followed and employed the methods of technique of Lister, Pasteur, Koch and the more modern school of surgeons and pathologists and has watched with keen and scientific interest the development of comparatively safe surgery and the wonders of animal experimentation in relation to medical research.

His new book entitled "Animal Experimentation and Medical Progress" is practically an autobiography of his own experience in this field, and is in itself, probably the most conclusive arraignment of the ridiculous position and the talks of the anti-vivisectionists. While the book consists practically of a number of papers which Doctor Keene has published from time to time in various medical journals, it is in a real sense a unit. So concisely and clearly is the book written that the layman who knows little or nothing about the technique of surgery and modern laboratory methods can follow Doctor Keene with great interest. Several of the chapters deal specifically with the anti-vivisection campaign and here the fact that Doctor Keene himself has been the butt of more than one attack by the fanatics of this campaign, makes his statement doubly valuable for others who are having similar experiences. The titles of a few of the chapters indicate the scope of the work. Some of these are "The Progress of Surgery as Influenced by Vivisection"; "Modern Antiseptic Surgery and the Rôle of Experiment in Its Discovery and Development"; "Our Recent Debts to Vivisection"; and "Recent Progress in Surgery."

Dr. Charles W. Eliot, President Emeritus of Harvard University, has written the introduction to the book.

Worry and Nervousness or The Science of Self Mastery. *By William S. Sadler, M. D. Chicago, A. C. McClurg & Co., 1914. 535 pages. Price, $1.50.*

This book is designed for the general reader. Considering this fact one is at first disposed to object to its size and to question whether a more concise treatise would not be more widely useful. Examination shows that the extent of the work is not due to diffuseness of style but to inclusiveness in subject-matter. The volume is almost encyclopaedic. It is, nevertheless, well-organized and readable. There are two parts, the first devoted to causes and manifestations, the second to the treatment of nervous disorders.

The presentation of the material, descriptive and didactic, is clear and sane. The author shows exceptional poise and discretion in defining the value and the limitations of psychotherapy. His great interest in blood pressure variations is evidenced at frequent intervals. The illustrations can scarcely be said to add to the substantial worth of the book. If one were to make them the sole basis of judgment one would infer that the writer was offering 500 pages of Sunday journalism and injustice would be done to an excellent manual.

Percy G. Stiles.

HEALTH DEPARTMENT REPORTS AND NOTES.

REPORTS.

Brockton, Massachusetts.

The thirty-second annual report of the Board of Health of Brockton measures up well with the reports of previous years and shows several improvements. The death-rate for 1913 is given as 10.88 (the lowest recorded for the past twenty years), with the population estimated at 62,500. The financial statement shows an expenditure of $14,776 for salaries and general expenses, $13,831 for refuse collection and removal, and $12,690 for contagious diseases.

Epidemics of infantile paralysis, diphtheria and scarlet fever are noted. Nothing was discovered of significance in the twenty-one cases of infantile paralysis to indicate the source of the disease. No secondary cases were noted. The diphtheria epidemic was apparently caused by missed cases and carriers. Thirty carriers were discovered in the schools and treated in the same manner as true cases as far as exclusion from school and quarantine were concerned. A tuberculosis nurse was added to the staff; $9,066 was expended for the care of tuberculosis cases, the larger part of this being expended in the cost of cases sent to sanatoria.

One hundred and fifty-four deaths under one year occurred, giving an infant mortality rate of 89 per 1,000 births reported. The board is planning to take over the work of the Milk and Baby Hygiene Association. Medical inspection of schools is carried on very successfully. The city laboratory continues under Mr. George E. Bolling to do yeoman service; 6,527 specimens were examined either chemically or bacteriologically; 89 per cent. of milk wagon samples had less than 500,000 bacteria per cc., the bacterial limit of the board.

The statistical tables in the report are excellent. Many of the forms recommended by the Massachusetts Association of Boards of Health have been adopted and demonstrate their value. It is regrettable that more Massachusetts cities and towns do not follow Brockton's example. The report on the whole is indicative of good work and the initiation of new activities each year shows that the work is likewise progressive.

St. Paul, Minnesota.

Dr. Howard Lankester, Commissioner of Health of St. Paul, presents for 1913 his customary excellent report. Conditions along sanitary lines in St. Paul are open to improvement, as Dr. Lankester frankly admits, but it is a fact that they are ahead of many cities of similar size, especially in the Middle West. The tone of the reports of the commissioner and his staff shows a progressive spirit and the contents of the reports indicates good results.

St. Paul is a city with an estimated population of 255,000 and has, in general, naturally good sanitary conditions. The low death rate, 10.01 per thousand population, is probably due rather to these natural assets and to the efficiency of the health department than to any appreciation on the part of the city of the importance of public health work. This conclusion is based on the fact that only forty cents per capita population is expended through the health department and of this only sixteen cents is expended in strict health work, the remainder going for garbage collection and the maintenance of public baths.

The contagious disease situation as reported by Assistant Commissioner Cook is good but is in a precarious condition owing to the lack of a sufficient number of medical inspectors, especially in the schools. One school physician and six nurses are obliged to supervise 30,000 school children and in consequence epidemics of measles and scarlet fever, which start in the schools, run their course almost unchecked, since mild or incipient cases are not recognized and excluded until they have spread the infection. Serious epidemics of diphtheria and typhoid were promptly traced to their source (dairies) and suppressed. Free anti-typhoid inoculations were given by the department to those exposed with perfect results.

The milk situation has been materially improved by the passage of an ordinance requiring the bottling of all market milk. The city can require the inspection of only those cattle kept within the city limits and anyone may obtain a license to sell milk in the city by paying a dollar to the state without any inspection whatever.

The work of the tuberculosis division is carried on by five nurses who make frequent calls to all cases reported. Owing to insufficient legislation, the reports of cases are not complete, but it is estimated that more than half are known and indexed by the division.

Reports of vital statistics, finance, and of the other divisions are neat and well prepared. It is to be hoped that the new board which succeeds the old, under the new charter of the city, will do as well.

DEPARTMENT NOTES.

Better Meat Supply in Indiana.

The *Monthly Bulletin* of the Indiana State Board of Health for June, 1914, gives an account of the effort on the part of the Board to secure more sanitary slaughterhouses and a better inspection of the meat supply than is at present afforded the residents of the smaller cities of the state.

Two letters have been sent out to health officers and mayors. The first of these calls attention to the need for improvement and suggests that the health officer take up the matter with his mayor. The second letter, to the mayor, is the more important. It states the results of many investigations and inspections and quotes Circular 185 of the Bureau of Animal Industry as follows:

"1. A well-regulated system of slaughterhouses is as necessary to the *public health* as is a well-regulated system of schools to the *public education.*

"2. Every slaughterhouse is a center of disease for the surrounding country, spreading trichinosis, echinoccocus disease, gid, wireworm, and other troubles caused by animal parasites, and tuberculosis, hog cholera, swine plague, and other bacterial diseases.

"3. The important factors concerned in spreading these diseases are offal feeding, drainage, rats and dogs.

"4. These diseases may be greatly held in check and in some cases entirely eradicated in two ways: First, by a reduction in the number of premises on which slaughtering is allowed, on which account *it is urged as all important that there be a segregation of slaughterhouses, so that all the butchers of any given town will be compelled to do all their killing in a common inclosed and restricted area.* Second, by regulating the factors concerned in spreading the disease: (a) Offal feeding should be abolished; (b) drainage should be improved; (c) rats should be destroyed; and, (d) dogs should be excluded from slaughterhouses.

"5. The appointment on every local board of health of a competent veterinarian, whose duty it shall be to control the class of meat placed upon the block. *All meats should be inspected at the time of slaughter, thus securing for the local consumer the same guaranty that the National Government provides for the foreign consumer and for interstate trade.*"

The State Board finally offers such assistance and coöperation to all cities in the development of any plans they think desirable.

Compulsory Vaccination.

The city of Louisville, Kentucky, has adopted and will enforce rigid vaccination laws during the coming year in an effort to reduce the high smallpox morbidity which obtained during the year just passed. The following quotation from the bulletin of the city health department tells the story:

"Last year nearly seven hundred cases of smallpox were treated at our Eruptive Hospital. An epidemic of smallpox in any community in this day of preventive medicine reflects great discredit on the city and its government.

"To prevent a similar outbreak this year, the State Board of Health is coöperating with the City Health Department and the state and city laws of compulsory vaccination will be enforced.

"All those persons who refuse to obey the law will be served with a warrant and presented in court. The fine is from $5 to $50."

Reporting Diseases.

Dr. B. F. Howard, Director of the California State Bureau of Tuberculosis, has made very encouraging progress in securing the reporting of this disease before death. In 1914 the morbidity reports have for the first time exceeded the mortality reports and while the good work has not gone as far as could be desired, still the state is getting a much better idea of the magnitude of its tuberculosis problem. The following table shows the change:

TUBERCULOSIS.

September.	Reported at death.	Reported before death.
1912.......	316	129
1913.......	405	204
1914.......	360	510

Patent Medicines.

The following extracts from the Sanitary regulations of Brazil, quoted in the weekly bulletin of the New York City Department of Health, show how far the Government of Brazil is ahead of the United States or any local authority here, in the matter of regulating the manufacture and sale of secret nostrums:

"The advertisement and sale of secret remedies, as well as the sale of drugs and medical preparations in establishments which are not duly licensed or upon the streets or sidewalks, are expressly prohibited. *Those preparations are considered secret remedies which are laboratory preparations made according to a formula not included in pharmacopœias of general acceptance and those not licensed by the Department of Public Health.*

"Remedies of ordinary and inoffensive use, to be found in lists approved by the Government, and laboratory preparations licensed by the Public Health Department, are excepted; and no other medicine or preparation can be sold by a pharmacist or furnished to any one whosoever without a prescription from a duly authorized physician.

"Every pharmacist who wishes to sell laboratory preparations invented by others, under a special name, must indicate on the respective labels the pharmacopœia in which the formulas of such preparations are to be found after obtaining the necessary authorization from *the Department of Public Health, which will pass upon all statements which are to be made or can be made in the respective labels or advertisements; all preparations whose labels do not contain the express authorization referred to are considered secret remedies, subjecting the pharmacists to the penalties fixed in these regulations.*

"The inventor of any antiseptic preparation, remedy or perfume, wishing to offer it for sale, shall make application for a license from the Department of Public Health, presenting therein a report in which he declares the composition of the product, the manner of manufacturing and applying it, and the circumstances under which its use can be beneficial. This report can be placed in a sealed envelope which will be opened by the director general of the Department, who will report upon it to the pharmacist, after which it will again be sealed and deposited in the archives of the Department.

"With the application the inventor will present a certain quantity of the product, which shall be forwarded to the National Laboratory of Analyses for the purpose of securing the report of the latter respecting it, the director general being authorized, if it is deemed advisable, to order experiments to be made in public hospital or school establishments, after the chemical composition of the product is known.

"*The director general shall give confidentially to the chief of the laboratory the formula of the composition, when it is to be analyzed.*

"When the license has been obtained, the inventor can place the product upon sale, with the declaration that such sale has been authorized by the Department of Public Health; but it is *absolutely prohibited to advertise in newspapers, or otherwise, qualities of a therapeutic nature which have not been established or admitted by the Department.*"

Isolating Tuberculosis.

The Board of Health of Duluth, Minn., passed the following drastic regulations:

"WHEREAS, tuberculosis is now recognized as a communicable disease,

"*Therefore*, Be it resolved that a case of open tuberculosis must be isolated either in a sanatorium or at home;

"*Resolved*, that all early cases shall be so cared for as to prevent the disease from reaching a state that will become dangerous to others, if possible."

A competent and experienced man has been placed in charge of the new tuberculous division and measures are being rapidly taken to provide all the accommodations which the task outlined in the above simple resolutions entails.

Educational Work of the New York City Health Department.

A program of educational work recently undertaken by the Department of Health of the City of New York promises great things. Though familiarity with advances in medical and sanitary science is necessary to their highest efficiency, the medical and lay employees of health departments find it difficult to keep up with the rapid progress along such lines. To overcome this difficulty the New York City Health Department has provided four courses of lectures, one for its medical inspectors and other physician employees, one for its lay inspectors (food and sanitary), one for its hospital nurses, and one for its field nurses. Attendance is not compulsory, but employees are expected to be prepared to pass an examination, at the termination of the course, on the subjects discussed. All the courses except that for hospital nurses (which is given in the various hospitals for contagious diseases) are open to the public. The health department further offers to provide lectures on any of the subjects in the course on application from organizations. The plan and scope of this work are so good that the results cannot fail to be a great public benefit.

Journal American Medical Association, November 7, 1914.

A Jail Sentence for Selling Adulterated Milk.

Repeatedly prosecuted by the Department of Health for violation of its milk regulations, and in spite of this continuing his illegal practices, a Brooklyn dealer was sentenced in the Court of Special Sessions, on November 12, to pay a fine of $250 for selling milk improperly labeled and to serve three months in the City Prison for selling adulterated milk.

New York Medical Journal, November 28.

Etiology of Pellagra.

Meritorious at least of thorough investigation is the work and thesis recently announced by two Italians, Alessandrini and Scala, which tells of the results of investigations which have been going on since 1909 on the etiology and treatment of pellagra. An editorial in a recent number of the *New York Medical Journal* (October 3) tells of the conclusions:

"The work led them (the investigators) to two fundamental conclusions: 1, Pellagra does not depend absolutely upon the eating of maize; 2, it is a disease clearly localized and limited to zones where the drinking water comes in contact, more or less exclusively, with clay soils. The fact that pellagra has been eliminated in pellagrous districts by the substitution of drinking water from outside, led the authors to suspect water as the carrier of the infection.

"On account of the analogy between pellagra and certain diseases due to animal parasites, especially Filariidæ, which present the periodical spring and summer exacerbations with remissions in the winter, the writers at first supposed that pellagra might be due to a parasite of this class. Some experiments on monkeys, however, were considered conclusive in ruling out animal parasites; bacteriological examination of the water in infected districts resulted negatively; there remained, therefore, under suspicion, only the organic and inorganic substances suspended or dissolved in the water. Various reasons led to the exclusion of organic material. It had never before been suspected that the common mineral substances, in potable water at least, might provoke such disturbances. The elimination of all other factors and a careful study of the mineral content of the water led the writers to suspect the colloidal silicic acid."

Alessandrini and Scala believe that they have proved by animal experimentation that pellagra is merely a mineral acidosis and have deduced that the rational treatment for the disease would be the administration of an alkali. They simply inject into the patient trisodium citrate which upon oxidation sets free sodium carbonate and neutralizes, according to their theory, the silicic acid present. The experimental results of such treatment follow:

"The first experiment was made on a dog, which showed improvement in eight days. It received daily intramuscular injections of one cc. of a five per cent. solution of trisodium citrate; the injections of silicic acid which had first caused symptoms were continued. Pellagrous persons were then treated by administering intramuscularly one cc. of a ten per cent. solution of trisodium citrate, usually at twenty-four hour intervals. The results in ten cases are reported, improvement in every case being noted within a very short time. This treatment is so simple and harmless that it merits a thorough trial. The writers feel that the prophylaxis of pellagra depends merely upon attention to the water supply."

Knowledge of Demography Necessary for Officers of the Service Public Health.

Surgeon-General Blue, United States Public Health Service, has recently issued a set of questions intended to illustrate the kind of examination in vital statistics submitted to those who intend to enter the United States Public Health Service. These questions cover a field of vital statistics dealing with marriage reports, birth records and statistics, morbidity reports and statistics, death registration and statistics, infant mortality and life tables. This step indicates a growing appreciation of vital statistics and progress in preparing them.

New York Medical Journal.

A Bacillus Carrier.

The latest report of a typhoid bacillus carrier comes from Hartford, Conn., and is on the authority of Dr. C. P. Botsford, Health Officer of that city. A man who had had typhoid in November, 1913, was employed on the farm of a dairyman and helped occasionally with the milking. Twelve cases of typhoid appeared on the route supplied with milk from this dairy, early in September, 1914. In the early part of November thirty-four cases developed suddenly on the route of another milkman and it was found that the same man, who was employed on the first dairy shortly before the first outbreak, was now a milker where the milk of the second dairy was produced. Examination of the man's feces proved beyond doubt that he was a carrier and was the cause of both epidemics.

Overcrowded Cars.

The question as to the overcrowding of cars as a public health problem of vital importance has been brought up recently in New York City when Commissioner Goldwater addressed the Public Service Commission, inquiring whether the subway management was withdrawing cars from the subway tracks during the day between rush hours to such an extent that the cars were unnecessarily crowded. If the companies were guilty of such practice he said they were "culpable of a serious offence."

Commissioner M. R. Maltbie, of the Public Service Commission, made a public statement about a week later that the charges were quite true and conceded that wilful injury is being done the people by the transit companies. The City Board of Health has reason to believe that improvement will be the result of Mr. Maltbie's statements and efforts and is awaiting developments.

Phenomenal Health Work.

Evidence of the possibility of very great improvements in health conditions in the South is furnished by the record of the work of Dr. B. W. Page of Robeson County, South Carolina, the reduction of the death-rate from 18 to 12 in three years in a county, of which only 45 per cent. of the population is white.

Dr. B. W. Page believes the death-rate to be the correct index to health work. He has compiled the following statistics as an index to his work as whole-time health officer of Robeson County for three years, his work beginning March 1, 1912:

Deaths.	1911.	1912.	1913.	1914.
Tuberculosis...........	147	125	70	45
Diarrheal (infants)	90	75	65	4
Typhoid................	33	7	9	4
Smallpox..............	16	8	1	0
Diphtheria.............	14	6	3	4
Whooping Cough........	35	22	9	3
Pneumonia.............	130	125	85	25
Total for all diseases...	907	845	730	580

More Help for the Health Officer.

In the November number of *Public Health* published by the Michigan State Board of Health, there appears an article by Dr. E. V. McComb, the Health Officer of Menominee, Michigan, in which he arraigns the physicians of Menominee in particular and all physicians in general for lack of support of the health department. He remarks that in order to perform his duties as Health Officer he must first know where the diseases are and under what conditions they exist.

Doctor McComb reports that in the past year only 16 cases of tuberculosis were reported to him. In the past two years there were but 50 reported cases out of 75 actual cases of typhoid, and 38 of these were reported very late in the disease or after recovery. Failure to report births is also noticed by Doctor McComb.

That the physician should be an instructor to his patient is emphasized in this article. The physician should instruct in such things as disinfection, prophylaxis in typhoid, care of sputum in tuberculosis patients. Direct "negative" teaching has been run across by Doctor McComb. Such things as allowing whooping cough or measles to run through a family "to have it over with" is, of course, objectionable. The desire to cut short quarantine so as to let the patient attend school or to go back to work again has also been noticed.

Doctor McComb asks for the following eight things from the physicians:

"1. A renewed interest in the work of the Health Department, making that work a part of your business;

"2. That a renewed attention be given to the reporting of all contagious, occupational, and environmental diseases;

"3. That births be reported within 10 days;

"4. To have you consider that sanitary matters are not entirely the business of someone else;

"5. To come forward with advice, suggestions, and help for the Health Department on all occasions;

"6. To treat all doubtful cases of disease as the real thing until certain of the contrary;

"7. To ask, in short, for your more complete coöperation with the Health Officer in the work of his office; and

"8. To remember that you, while practicing medicine, have an individual duty in teaching the true fundamentals of health, the prevention and care of disease, and that it is just as much your duty as it is that of the Health Officer."

Community Nurses.

That there is a real place for the public health nurse and that her sphere of usefulness is not limited to the city is shown by an article in the October number of the *Dietetic and Hygienic Gazette* which comments on the state-wide interest developed in Illinois in the "community nurse" idea. The originator, Miss Harriet Fulmer, has recently been made the Extension Secretary of the Association for the Prevention of Tuberculosis. Her method of extension work as given by Dr. Evans in the Chicago *Tribune* is quoted by the *Gazette* and is as follows:

"The central idea of Miss Fulmer's plan is to secure community visiting nurses. Sometimes a nurse is employed to look after an entire county. Sometimes a string of towns located along an interurban line will employ a nurse.

"If the nurse looks after a county, the county supervisors are asked to pay a part of her salary. If she looks after a group of towns and villages, that portion of her salary to be paid by the governmental bodies is prorated among the towns and the councils are asked to appropriate the necessary funds.

"Town and county rural nursing service is now in operation in Richland, McLean, Livingston, and Morgan counties. In Livingston County Miss Fulmer enrolled 3,000 school children in the Livingston Open Air Crusaders. The rules for membership were:

"(a) Sleep with your window open.

"(b) Have fresh air where you work or play.

"(c) Breathe through your nose with your mouth closed.

"(d) Get the rest of your family to do the same."

It is stated that other communities in the state are falling in line and this should cause no wonder when it is remembered that the community nurse can find numberless ways of benefiting the people she has occasion to visit.

Another "Carrier."

In the *Journal of the American Medical Association* for October 31 is to be found a detailed statement of the epidemiological study of an outbreak of typhoid fever in Hanford, Cal., in which ninety-three cases of the disease were traced to infection at the hands of a single "carrier" who helped to prepare a public dinner. The following conclusions, drawn by the writer, Dr. Wilbur A. Sawyer, director of the California Hygienic Laboratory, are important and merit close perusal:

"1. The source of infection in the ninety-three cases of typhoid fever in the Hanford epidemic was a typhoid carrier who prepared food served at a public dinner.

"2. The vehicle of the infection was a large pan of Spanish spaghetti prepared by the carrier. This dish was baked after it had been infected, but this baking was shown by laboratory experiments to have incubated the bacteria instead of sterilizing the food. Certain customary methods of cooking are thus shown to be inadequate as a protection against infection.

"3. The incubation period in the majority of the cases in this epidemic of typhoid fever proved to be shorter than the time usually regarded as the minimum. The first case developed three days after infection. More cases showed their first definite symptoms six days after the infected food was eaten than on any other one day.

"4. The ways in which a carrier may transmit infection are so varied and so numerous that attempts at the control of mere channels of infection will not offer sufficient protection. Those who were suspicious of the raw salad at the dinner in Hanford and ate the freshly baked spaghetti turned from a safe dish to one which was heavily infected. The best protection against carriers will come through investigation of the source of infection in every case of typhoid fever. When carriers are discovered, they can be advised and controlled.

"5. Until there are more trained epidemiologists on a full-time basis among state and local health officials, the danger from carriers will not be noticeably diminished, and the individual will find in anti-typhoid vaccination his best protection against infection from carriers."

The Schick Test.

The Board of Health of the city of Rochester, N. Y., makes a systematic use of the

Schick Test for determining the immunity of persons to diphtheria and to every physician having a case of diphtheria the following statement is sent:

"DEAR DOCTOR:

"You have a case of Diphtheria in the family at............Street.

"Referring to the recent bulletin of the health bureau relating to the administration of antitoxin and containing a résumé of Schick's work in testing for immunity in Diphtheria, I have to say, that we are able, through the courtesy of Drs. Park and Zingher of the N. Y. City Dept. of Health, to furnish you with material for testing the immunity of any member of this or associated families.

"The diluted toxin furnished for the test will keep only about one week, and even then it must be kept in the ice box. Therefore, when we furnish this material, you must be careful to keep it cold, and use it within a few days after you get it. Yours respectfully,

"GEORGE W. GOLER,
"*Health Officer.*"

Hookworm in Dogs.

It has long been known that hookworm is a very common disease in dogs, some authorities estimating that from 25 per cent. to 40 per cent. of all pups born in some parts of the country die as a result of the ravages of this parasite. It is rather interesting to note that two members of the Florida State Board of Health have recently apparently proved that the mysterious disease known as "Black Tongue" of dogs is caused by a hookworm infection. Since a curative treatment of this disease is known, the eradication of the infection in dogs becomes a possible means of reducing its prevalence among human beings.

No More Patent Medicines.

Patent medicines have been left completely out of the latest issue of the catalogue of one of the largest mail order houses in the country and prominent among the reasons assigned for this are the following:

"We find valueless and even dangerous medicines offered to the public through the medium of advertising that is extravagant, misleading and deceptive—advertising calculated to deceive the well into the belief that they are sick and to induce the sick to pin their faith to ineffectual means for recovery.

"That patent medicines are more than likely to be disappointing as well as dangerous is apparent when we consider the fact that the all-important as well as the most difficult thing in the treatment of disease is that of finding the real underlying cause of the trouble, and the further fact that the person least able to form a safe judgment in this matter is the patient himself.

"The person who falls a victim to the advertisement that attaches a grave meaning to every little ache or pain, when in reality nothing ails him that forgetting would not cure, is at least defrauded.

"The person who depends on an advertised nostrum to cure a serious ailment, which to be successfully treated must have only the most prompt and skillful attention, is throwing away valuable time. The most dangerous medicine, especially in the case of the lingering diseases that drugs alone can not cure, is that which, by containing a stimulant or an opiate, causes its victim to feel better for a while. Being thus encouraged in a vain hope, though all this time the lurking disease is steadily progressing, he often turns too late, if he turn at all, to rational means for recovery."

Law Enforcement.

Boards of health often find themselves without power to enforce law already existing or regulations they make. That the lack of such power does not make progress absolutely impossible is shown by the Report of the Executive Board of the Philadelphia Housing Commission for 1913 which under the head of "Law Enforcement" says:

"The Commission does not prosecute violators of housing laws. It interprets such laws to the tenants who live on properties where violations exist and urges them, if they are personally responsible, to make corrections, or, otherwise, to bring the defects to the attention of the landlords. Practically

10 per cent. of last year's complaints were corrected in this way."

Toronto Health Bulletin.

The diversity and breadth of Public Health interest in Toronto, Canada, is shown by the monthly bulletin which its Board of Health publishes. Realizing that the problem of the quantity and quality of the food supply is one of the most vital of public health interests, the *Bulletin* in a recent issue took up the question in a very practical way. It told of short weight bread production and warned citizens to weigh all their bread, told housewives how to discriminate between frozen and unfrozen potatoes when buying, discussed fruit and vegetable yields and made suggestions in regard to the use of vacant city lots.

One of the triumphs which this bulletin announces is that of the "Baby Saving Campaign" of this summer. To quote:

"The Baby Saving Campaign organized this past summer by the Department has certainly justified itself. During the three summer months, June, July and August, there were *200 less infant deaths* than in the same months last year.

"The death-rate from Infant Diarrhœa, the most deadly and at the same time the most preventable disease of infancy, has this summer been *cut in half.*"

The Health of the Negro.

In a recent report the Board of Health of Cincinnati calls attention to certain vital statistical facts for the year 1913 in regard to the health of the Negro. It says:

"A glance at the report of the vital statistician for 1913 reveals facts pressing for solution. The general death-rate (white and colored) was 16.34 per 1,000 of population. The white death-rate was a fraction under 16 per 1,000, while the colored was 33.40 per 1,000, or over 100 per cent. more.

"Remembering the ratio of colored to white population it is shown that where one white child dies before birth three colored children meet the same fate; that over four times as many colored people die from tuberculosis; four and one-half times as many of them die of the "Black Plague"; over twice as many of them died of alcoholism; two and one-half times more of them die of general paralysis of the insane; over twice as many of them die of diseases of the circulatory system; over three times as many of them die of pneumonia, and almost twice as many of them die of acute and chronic Bright's disease."

PUBLIC HEALTH NOTES.

Cholera in the Philippines during 1913.

V. G. Heiser, who makes this report, states that in Manila, up to December 31, there were 210 cases, with 137 deaths, and in the provinces 639 cases, with 510 deaths. As regards measures to combat cholera, the whole campaign was directed toward the prompt disinfection of the stools and vomited matter of the sick and of the carriers. In the treatment, intravenous transfusion of salt solution was mostly depended upon. The experience in this outbreak, Heiser says, has again forcibly demonstrated the necessity for further laboratory studies regarding cholera. The reasons for the simultaneous appearance of the disease in widely separated sections, if clearly understood, might be of great assistance in combating it.

New York Medical Journal, November 28.

Malaria.

Supplement No. 18 to the Public Health Reports July 17, 1914, is entitled "Malaria: Lessons on Its Cause and Prevention." It is in the form of a catechism and is intended for use in the schools. It is admirably suited to the purpose, is concise, has excellent and simple diagrams and microphotographs and, in style, will appeal to both teachers and pupils. Copies can be obtained from the Government Printing Office at Washington, D. C.

Compulsory Vaccination.

Vaccination for smallpox has now thoroughly proved its efficiency. The fact that the various states have widely differing laws concerning vaccination make the following arguments for compulsory vaccination of more than passing interest. During thirteen years more than thirty-six million children were vaccinated in Germany. Of these 115 died within a few weeks or months although at least forty-eight did not die as a direct result of vaccination. In the Philippines 3,515,000 persons have been vaccinated without a single death.

"Germany has from 1874 had compulsory vaccination. There have since been no epidemics of smallpox in the Empire, although the disease has been frequently introduced from without, especially from Russia. In 1897 there were but 8 smallpox deaths among fifty-four million German people. Since 1897 long periods have passed without a single variola death. Since 1874, in the huge German army, where discipline is inexorable there have been only two deaths from smallpox, one of these of a reservist who had not been successfully vaccinated. Compulsory vaccination has averaged 1 to 3.5 smallpox deaths per million. Belgium, Russia, Austria, Italy, Spain, without compulsory vaccination, have averaged respectively 164, 231, 510, 536 and 963 smallpox deaths per million of population."

Bovine and Human Tuberculosis.

The December issue of the *Journal of State Medicine*, London, is devoted almost completely to the consideration of the relationship between bovine and human tuberculosis and expresses rather fully the work done along this line through the activity of the Royal Institute of Public Health. A paper by G. Sims Woodhead summarizes the past and present attitude of the organization toward bovine and human tuberculosis, mentioning some of the things which led to the belief in the susceptibility of man to the attack of the tubercle bacillus of the cow. Such as: The discovery of a large amount of intestinal tuberculosis in children which was apparently due to drinking the raw milk of tuberculous cattle; the appearance of a large number of blood cells in milk which may assist in introducing the bacteria; and, in more recent days, the study of bacilli from tuberculous patients by cultural methods and by animal inoculation experiments. Much of this recent work, which has been done by Doctors Fraser and Mitchell, receives consideration in the other papers of the *Journal*, one by H. J. Stiles and one by Prof. Sheridan Delepine.

As the result of bacterial examination of the milk derived from operations Dr. Stiles states that 75 per cent. of the surgical tuberculosis of Scotland is due to infected milk and that 90 per cent. of the cases of tuberculosis of the small glands of the neck and head are due to infection by bovine bacilli which have gained access through the tonsils.

Delepine has collected many statistics showing the prevalence of tuberculosis of the bovine type. We quote from his conclusions:

"The information supplied by the various methods indicates:

"(1) That an exceedingly small number of children are tuberculous at birth.

"(2) That soon after birth they begin to contract the disease.

"(3) That the nature of the tuberculous lesions and their distribution show that before the fifteenth year the alimentary passages are important channels of infection, and that after the fifteenth year infection generally takes place through the air passages.

"(4) That, when the matter has been investigated, it has been found that among children suffering from tuberculosis other than pulmonary tuberculosis a great number have been fed on unsterilized cows' milk.

"(5) That from the lesions of children fed on unsterilized cows' milk, bacilli resembling those associated with bovine lesions are found in the great majority of cases.

"(6) That both the distribution of the lesions and the characters of the bacilli seem to indicate that not less than 20 to 25 per cent. of the cases of infantile tuberculosis are attributable to infection through cows' milk, and that some results indicate a much higher proportion.

"(7) That experimental evidence shows that the ingestion of tuberculous cows' milk is followed by infection through the alimentary canal in the great majority of mammals on which the experiment has been made."

The Friedmann Treatment for Tuberculosis.

In March, 1913, a board of officers of the Public Health Service was appointed to investigate the Friedmann treatment for tuberculosis. This board consisted of Surgeon John F. Anderson, Director of the Hygienic Laboratory, and Surgeon A. M. Stimson. The general conclusions of the board, which were published in *Public Health Reports* for November 6, 1914, are as follows:

The claims made by Doctor Friedmann for his method of treating tuberculous infections are, in brief, that, by means of injections of a living acidfast organism, harmless of itself, he is able to cure cases of tuberculosis, pulmonary or otherwise, which have not already advanced to that hopeless stage where death is imminent. From the manner of presenting these claims and from the fact that successes only and not failures are reported, the reader is bound to assume that such results are the rule; in other words, that a sovereign remedy for tuberculosis has at length been discovered, and incidentally that a method has been devised for the administration of living acidfast organisms, a method which avoids abscess formation, a complication which has hitherto limited their employment.

The results of the investigation here reported do not confirm the claims made by Doctor Friedmann. We find, in brief, that the preparation used by him is not strictly devoid of dangerous properties of itself, still less so when injected into tuberculous subjects; that the favorable influencing of tuberculous processes by his methods is certainly not the rule, and that if we are to ascribe to the Friedmann treatment the improvement noted in a few cases, we are equally bound to impute to it the serious retrogressions.

We find that the organism used by Doctor Friedmann differs in important cultural characteristics from any heretofore recognized tubercle bacillus. The subcutaneous and intramuscular inoculation of animals with the Friedmann organism causes the formation of abscess in over 25 per cent. of the animals treated. The treatment of animals with the Friedmann organism—rabbits and guinea pigs—either before or subsequent to infection with virulent tubercle bacilli, is followed, as a rule, by an increased susceptibility to the disease. Inoculation of monkeys with the Friedmann culture did not show either curative or protective action in those animals against tuberculosis.

Summary.

The claim of Dr. F. F. Friedmann to have originated a specific cure for tuberculosis is not substantiated by our investigation.

The claim of Dr. F. F. Friedmann that the inoculation of persons and animals with his organism is without harmful possibilities is disproved.

New York Medical Journal.

American Tetanus Antitoxin Going Abroad.

Tetanus antitoxin is being administered to wounded soldiers in Europe to prevent the occurrence of lock jaw to such an extent that all American firms which produce this product have received large orders from the warring nations. Its geueral use throughout this country makes this condition interesting because of the possibility of a famine in this commodity here as well as because of its successful use abroad.

Clinical Medicine, December, 1914.

Septic Sore Throat.

Dr. John O. Roe has an article in the *New York Medical Journal* of November 28, dealing with severe inflammations of the throat. He states that an examination of a number of cases, even those in the reported milk-borne epidemics, shows that the disease is due to a mixed infection although to be sure the streptococci usually greatly predominate. Hence one cannot with certainty select a particular organism as to the cause of the disease. Furthermore, organisms of the same types are present in small numbers in the normal throat and the infections, serious in themselves and often followed by pericarditis, nephritis, pneumonia, pleurisy, or peritonitis, are often due to a weakening of the vitality of the person affected more than to any other cause; and the virulence of the disease depends more upon the condition of the patient than the character of the germ, although the introduction of a wandering germ of a new strain among the old saprophytas may seriously aggravate conditions. Thus, while milk streptococci may be capable of inducing such epidemics when these unknown external conditions render the throat right for it, it behooves us to look for the other causes in many cases as the primal cause of the epidemic.

Bacteriological Standard for Water on Transportation Lines.

A bacteriological standard has been approved by the Surgeon-General of the U. S. P. H. Service which shall govern the water supplied to passengers by the railroads and other common carriers doing interstate business. The total number of bacteria developing on standard agar plates at 37° C. in twenty-four hours must be less than 100. And not more than one out of five 10 cc. samples shall show the presence of organisms of the B. coli type.

Foot and Mouth Disease.

Clinical Medicine, December, 1914, gives some interesting though more or less familiar facts concerning the above-mentioned ailment. This is primarily an animal disease being mostly observed among cattle, less frequently in sheep, swine and horses or the carnivorous animals. It is transmissible to man and is spread by contact as well as by the saliva, milk, and excreta of the infected animals. It is caused by a filterable virus. At room temperature in daylight the organism loses its virulence within twenty-four hours; and heating to 70° C. destroys the virus within ten minutes. Under favorable conditions the virus has been kept for three or four months.

The symptoms of foot and mouth disease appear in from two to seven days after exposure. The temperature rises from two to six degrees; vesicles form in the mouth, on the feet and on the udders. These vary in size from that of a pea to that of a silver dollar. They soon burst, discharging a watery fluid and leaving behind a raw sensitive area. There is usually a discharge of frothy saliva and animals are unable to eat coarse food. Indeed they frequently hold their mouths open on account of the pain. Besides the unknown virus the fluid of the vesicles may contain other organisms (staphylococci and streptococci) which may modify the course and systems of the disease. One attack of the disease confers immunity and a vaccination is sometimes practised. Human infection may be brought about through the sources indicated but it is very infrequent.

The Infant and the Anti-Tuberculosis Program.

"Recent years have taught us that most of the cases of tuberculosis are contracted in early childhood; infection occurs frequently in infancy and the younger the child the graver the prognosis of the disease. Are we making use of this knowledge? Many infants are to be found under the care of tuberculous parents. Can this condition be avoided? What is the remedy? The establishment of preventoriums for infants seems the only available remedy and since these may be for the present, at least, simply wards in already existing institutions, the question of our duty along this line in the more urgent cases is pertinent."

Dr. Alfred S. Hess in the *Journal of the American Medical Association*, December 19, 1914.

Exhibits of Philippine Health Progress at the Panama-Pacific International Exposition.

The eyes of those who have been accustomed to regard the tropics and disease as synonymous terms will be effectively opened when they behold the remarkable exhibit of the Philippine Bureau of Health at the Panama-Pacific International Exposition in San Francisco. This unprecedented medical and hygiene exhibit has been prepared under the direction of Dr. Snodgrass of Manila and was shipped from that port to San Francisco on December 15 for installation in the Palace of Education and Social Economy. It consists of models of Philippine hospitals and clinics, instructive photographs, transparencies, charts, pathological specimens and specially prepared literature of interest to medical men and laymen alike.

Of all the improvements that have been achieved by the American administration of the Philippine Islands, none has been more remarkable than those affected by the Bureau of Health, particularly in extending modern sanitation to the remote "barrios," or hamlets, whose inhabitants, owing to their being so far removed from the best educational facilities of the islands, constitute the most ignorant portion of the native population. Naturally the Bureau of Health has been laboring against strong odds in spreading the gospel of modern sanitation and hygiene among this class of people, but the very determined attitude of the bureau has secured for it the crown of success.

Among the most striking and interesting of the models in the exhibit to be shown at the San Francisco Exposition are those representing "barrio" sanitation as developed by the bureau in its study of local conditions. A miniature Philippine "barrio," with the houses arranged on definite lines and provided with proper drainage canals, with streets illustrating an approved type of construction and drainage, and with hydrants and sanitary garbage facilities, will occupy a central position in the exhibit.

Provincial hospital construction will be represented by a model of the splendid new Southern Islands Hospital in the city of Cebu, which is ideal for tropical purposes in its type of construction, ventilation, arrangement of the rooms and wards, and sanitary provisions. This building is recognized as representing one of the most modern types of hospital construction.

A model of the combined laundry, bath and toilet, such as is in use at the Tondo Market, Manila, will also be exhibited, and a topographical model of the Mariveles quarantine stations, Manila Bay, represents one of the most modern institutions of its kind in the world.

Models of the sanitary water coolers introduced in the islands by the Bureau of Health, designed to keep the water from coming in direct contact with the ice, will be shown, as will also samples of the simple remedies packages supplied by the bureau of the municipalities of the islands.

A chart will be utilized to show the vitality of the cholera vibrio in different kinds of water. This chart demonstrates that ordinary sea water, which many people believe to be destructive to bacterial life, will harbor the cholera germ for a period of at least 106 days.

Other features of the exhibit will be: Charts illustrating the declining death-rate of Manila; the progress made in supplying provincial towns with notable artesian well water; the incidence of bubonic plague in the islands; the organization and activities of the Bureau of Health; the marked decrease in the incidence of smallpox following the eighteen odd million vaccinations performed during the past sixteen years, and a number of other charts along similar lines.

The exhibits as a whole will depict in a graphic and concise manner the very gratifying results obtained along sanitary lines in the Philippine Islands, and the methods employed to secure each result.

Hygiene Among the Negro Population.

The nature and work of the Negro Organization Society is commented upon at some length by Booker T. Washington in *The Southern Workman.* This society is endeavoring to bring about better social and industrial conditions by instruction and coöperation along sanitary, hygienic, sociological and moral lines.

Special attention is paid to matters of health, cleanliness and sanitary conditions, and here the organization is valuable to the white race as well as the black race. The positions of so many negroes in the servant class make improvement in matters of health a very important consideration.

From the industrial point of view we find the average length of life for the negro working man is 35 years. In Massachusetts the average is 45 years and in Sweden it is 50 years. In the state of Virginia, 41,000 black people are sick all the time, which means a yearly loss to the people of the state, in the way of earning power, of $23,000,000.

The average negro loses 18 working days in the year because of sickness and the author believes that over $100,000,000 could be saved to industry each year by the prevention of unnecessary disease. That progress is being made is shown by that reduction in death-rate among the negro population from 30 to 24 per thousand in the last 15 years.

Deaths from Measles.

Exposing children to the so-called "harmless" diseases is nothing short of criminal procedure. One of these contagious diseases that the public is prone to call harmless is measles. The following from the *American Magazine* emphasizes the main points:

"The mortality from measles is so great that the medical profession should take immediate steps to disabuse the minds of mothers that the disease is so trivial that no pains need be taken to prevent their own children contracting it or giving it to others. The last census report shows that in the registration area it caused 7/10 of 1 per cent. of all deaths, or about ten per 100,000 of population. More recent estimates place the deaths at 1 per cent. of the total mortality from all causes, but if we include the cases reported as bronchitis, pneumonia or tuberculosis, it is safe to say that it causes much more than 1 per cent. and that the total yearly deaths in the country are 12,000 or more, mostly young children. The census report says: 'Undoubtedly sufficient attention is not given by the health authorities and by the public to the restriction of this disease.' We heartily concur in this opinion. Experience shows that the public needs instruction and that it complies with reasonable restrictions as soon as it learns the necessity. Laymen are not fools and will not intentionally kill their own offspring, nor will they deliberately murder other children. The deaths are more numerous in cities. The disease is now quarantinable in New York state and the restrictions upon school attendance should be much more rigid than the law requires. People must also be told that it is infectious even before the stage of eruption and perhaps as long as there are nasal discharges."

INDUSTRIAL HYGIENE AND SANITATION.

Child Labor.

The recent report of the Chief of the Children's Bureau to the Secretary of Labor contains promises of some interesting information in regard to child labor. A complete summary of child labor laws of all the states, including 1914 statutes, will be published in 1915.

The administration of child labor laws in the various states has been studied at length. Reports on three states—Connecticut, Massachusetts and Maryland, are practically completed and will be out soon.

Workmen's Compensation Act.

A Government Report of September 17 gives statistics concerning the working of the Workmen's Compensation Act of May 30, 1908, during the last five years. Under this act compensation is made on the basis of the workman's wages and only when the disability is in excess of 15 days. In fatal cases the compensation equals the workman's wages for one year. The following is a summary of the cases reported:

The number of accidents reported in all departments during the first year (11 months) was 4,887, for the second year, 6,989, rising to 9,381 in the third year, to 10,157 (computed) in the fourth, and to 10,876 in the fifth, making a total of 42,290 for the five years. Of the total number of accidents, 1,006 were reported as fatal, the numbers for the five years being 233, 231, 207, 218, and 117, respectively. Approximately 10 per cent. of these fatalities were in occupations not subject to compensation under this or any other law. The number of claims increased from 1,818 for the first year to 3,526 for the fifth, the total for the period covered by the report being 14,963. Of this total, 14,046 were allowed, 911 were disallowed, and 6 were not acted upon. The total paid out as compensation amounted to $1,803,923.27. The payments for the first year (11 months) were approximately $243,000, for the second year $337,000, for the third year $411,000, for the fourth $435,000, and for the fifth $378,000.

Industrial Accidents.

At the third annual conference of the National Safety Council held in Chicago in October, Mr. G. L. Avery of Peoria, Ill., declared great faith in systematic and rigid physical examination of employees. He said:

"Every man in our plant of 1,000 hands has been thus examined inside of two months, two doctors and two assistants doing the work. Prior to taking up safeguards, which were the last factor to demand attention, we had been busy for over 18 months with education and coöperation. The result of all this has been that during 1913, 94.90 per cent. of all our injuries resulted in no lost time; while for the first six months of 1914, this percentage has risen to 98.35 per cent. We have secured good results from the use of our 'unsafe tags,' which are attached to any faulty machine or appliance to show that it is out of order and must not be used, under penalty of discharge, until repaired. Our eye bulletins, prepared in coöperation with our foremen, have secured fine results for us."

The Relation of the Railway Surgeon to Safety.

T. H. Carrow, Safety Inspector of the Pennsylvania Railroad Company, in an article read before the Pennsylvania Railroad Surgeons' Association, says in part: "During 1913 there were over 21,000 injuries, of which 268 resulted fatally, necessitating a disbursement by the Relief Department of $2,000,000. These figures clearly indicate why railway management is deeply concerned in the preservation of the health and the life and limb of the vast number of employees entrusted to its care.

Since 1910 every division has had a Safety Committee, composed of five men from the ranks, actively engaged in Safety Work.

The result is, that the thirty-five committees have made over 20,000 recommendations for safeguarding the working conditions, including improvements in sanitation and welfare work.

Each accident that occurs is carefully studied, as to cause and elimination of further danger.

Medical examination is thoroughly carried out and no man is permitted to enter the service of the company without passing a satisfactory physical examination.

The company has been richly rewarded for the thoroughness of its work, for statistics show that the death-rate has fallen from 14.6 per 1,000 in 1890 to 8.86 per 1,000 in 1913.

Resuscitation from Mine Gases.

A committee appointed by the Council of Health of the American Medical Association has recently submitted it sreport, "Resuscitation from Mine Gases":

"Summing up its experience and findings, the committee recommends artificial respiration in all cases of gas poisoning and, as mechanical devices are seldom at hand, manual methods are recommended for first aid. Of these the prone pressure method is recommended unless the patient is suffering from some local wound which makes this impossible, in which case the Sylvester method may be substituted. In all cases of carbon monoxid poisoning, oxygen should be given instead of air. If the victim is still breathing spontaneously, oxygen may be given by fastening to the face a mask provided with outlet valve, and an inlet valve, connected with a bag provided with oxygen from a cylinder. The Meltzer apparatus is recommended as the best of the mechanical devices available."

Journal American Medical Association, September 26.

Industrial Poisons.

The Massachusetts General Hospital has recently prepared a chart, which gives the effect of over fifty different industrial poisons on the following parts of the human mechanism:

1. Respiratory.
2. Gastro-intestinal.
3. Cardio-vascular.
4. Nervous.
5. Genito-urinary.
6. Muscular.
7. Skin and mucous membranes.
8. Eye and ear.
9. General.

The Hospital has also issued a list of directions for printers.

The Consideration of Color, Design and Acoustics in Factories.

The American Museum of Safety recently sent the following list of questions to two hundred factories in various parts of the country:

Have you considered the following factors as they affect the nervous energy of operators?

1. The color of walls and ceilings.
2. Noise of machines.
3. Proper lighting.
4. Cheerful and convenient lunchrooms.
5. Good architectural features and their influence on the mind.
6. The cultivation of grass, trees and flowers on factory premises.
7. The location of buildings with respect to surroundings, sunlight, prevailing breezes and recreation.
8. Do you agree that the efficiency of operators is increased when the above factors are considered in factory planning?
9. Was your factory designed by an architect or an engineer?

From those factory managers who have read the signs of the times and are keeping abreast of them, encouraging reports have been received.

The question of lighting, in a great majority of cases, is being handled by experts, who are laying stress not only on quantity, but on the effect which the lighting system will have on the eyes and nerves of the operators.

One large manufacturing firm has conducted some research work on the question of color, which is known to bear a direct relation to fatigue resistance. It was found that a warm gray was the best color.

Of those who replied, 75 per cent. are most emphatic in agreeing that the efficiency of operators is increased when the factors 1–7 are considered in factory planning.

The fifth point seems to have received little attention, but managers should not forget that a factory may meet all conditions imposed upon it and yet be a splendid example of the best in factory architecture, making those who are fortunate enough to be employed within its walls, happier and better workpeople, because of the quiet dignity, fitness, color and texture whose expression and use do not hamper operations.

"Safety First."

The Boston Elevated Railway Company reports, in the October *Bulletin of the American Museum of Safety*, that as a result of the "Safety First Campaign" conducted by the company in July, in coöperation with the Boston Chamber of Commerce, that there has been a marked reduction of accidents in connection with the collisions of cars and vehicles; also injuries to persons in alighting and boarding moving cars.

It is interesting in this connection to note the fact that the company has issued a notice to its employees engaged in transportation service, in regard to the use of alcoholic liquors. This notice reads as follows:

"1. All uniformed employees are hereby cautioned, that the habitual use of liquor, the resort of barrooms, or the use of intoxicants in any manner to such an extent as to affect their efficiency for the service is strictly forbidden by the rules.

"2. All men engaged in car and train service must be free from the liquor habit.

"3. Employees who report for duty under the influence of liquor or are found in that condition on duty will not be retained in the service.

"4. All officials and employees are expected to govern themselves accordingly."

Safety Rules.

The *Bulletin of the American Museum of Safety*, for October, prints the following Rules for Safety and Sanitation, which are in vogue at the Inland Steel Company's plants:

"1. Get the safety habit. Don't take chances. Learn all the rules. Understand your work thoroughly. Study the dangers incident thereto and avoid them. Think before you act.

"2. Do not work with defective chains, cables, tools or appliances of any kind, or in an unsafe place. Carefully examine same and report dangerous conditions to your foreman.

"3. Never work on a crane, table or other machinery, until you have notified the operator, and attached a sign, 'Danger, Do Not Move,' bearing your name, at the point where the power is turned on. No man except the man who placed it should ever remove such sign.

"4. Do not turn on any electricity, gas, steam, air or water, or set in motion any machinery, or throw down any material, without first seeing if anyone is in a position to be injured, and all safety guards are in their proper place.

"5. Do not go onto an overhead crane runway, for any purpose, without permission from your foreman, and then not until the cranemen have been notified and a sign, 'Danger, Men on Crane Track,' hung in cage before cranemen. After notifying craneman attach bumping block to crane rail between where you are working and cranes. Use same precautions when working near crane tracks.

"6. Wear goggles when working around circular saws, chipping, handling acid, cutting cables, and working at emery wheels.

"7. Do not ride on, or operate, engines, cars, cranes, elevators, or other moving bodies, or tamper with electrical apparatus, unless authorized to do so. Never leave your regular place of work except when required by your duties.

"8. If you make an opening, or remove the cover from any opening, in floor, ground, valve pit or sewer, guard that opening so no one can fall into it.

"9. Do not pile any material so high it is liable to fall, or cause another pile to fall, or allow it to lean against walls too weak to bear the pressure.

"10. Commit no nuisance; be clean and help to keep the plant clean. Conduct your private life so that you are at all times in the very best physical condition, wide awake and active.

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SOME RESULTS OF THE FIRST YEAR'S WORK OF THE NEW YORK STATE COMMISSION ON VENTILATION.

C.-E. A. WINSLOW, (Chairman) D. D. KIMBALL, FREDERIC S. LEE, J. A. MILLER, EARLE B. PHELPS, E. L. THORNDIKE, members, and G. T. PALMER, Chief of Investigating Staff,

Read before Joint Session Laboratory and Sanitary Engineering Sections, American Public Health Association, Jacksonville, Fla., December 3, 1914.

The New York State Commission on Ventilation was established "to examine and investigate the subject of ventilating systems in the public schools and other public buildings of the state, and the proper installation of the same to the end that a thorough and effective system, which will assure an adequate supply of fresh air, under the best conditions, will be maintained." In his statement in regard to the appointment of the Commission the Governor pointed out that "the problem is far from simple." He continued, "It is much more than an engineering problem, for the best scientific experts have not determined what conditions should be met by the engineers. Even the most fundamental facts which must lie at the basis of any efforts to ventilate our school buildings, have not been scientifically determined by any experiments which have been made thus far. It is not known, for example, and cannot be known without more adequate experiments than have been possible up to this time, what temperature should be maintained in public school buildings. Indeed, it has not even been proven whether a constant temperature or a varying temperature is more beneficial. We do not know scientifically what degree of humidity should be maintained in our schoolrooms."

The undertaking of this important task was made possible first of all by the generosity of Mrs. Elizabeth Milbank Anderson who made a large gift for various phases of social investigation to the Association for Improving the Condition of the Poor, of New York City; and secondly by the broad vision of the officers of the Association who realized that in so inchoate a subject as that of ventilation a sure foundation for practical advance could only be laid by a thorough study of fundamental scientific problems.

The members of the Commission who serve without pay include Mr. D. D. Kimball, Ventilating Engineer, Prof. Frederic S. Lee, Professor of Physiology in Columbia University, Prof. Earle B. Phelps, Professor of Chemistry, U. S. Hygienic Laboratory, Dr. James Alex. Miller, Professor of Clinical Medicine in Columbia University, Prof. E. L. Thorndike, Professor of Psychology in Teachers College, Columbia University, and Prof. C.-E. A. Winslow, formerly of the College of the City of New York, and now of the New York State Department of Health. The Commission was organized in June, 1913, formulated its plans at once and began actual experimental work about December 1, 1913.

Problems Before the Commission.

The researches of Flügge, Haldane, Hill, Benedict and many other investigators have largely revolutionized the attitude of physiologists toward the whole subject of ventilation and have indicated that heat rather than chemical poisoning is the cause of discomfort in ill ventilated rooms and have shown, as Professor Lee has expressed it, that the problem is physical rather than chemical, cutaneous rather than respiratory.

There still remain, however, many problems to be solved before the sound biological standards of good ventilation can be formulated; and without such standards the efforts of the ventilating engineer must continue to lack precision and effectiveness. There are four atmospheric conditions which produce or are supposed to produce unfavorable effects upon those exposed to them: high heat, alone or combined with high humidity, chemical effluvia of various sorts resulting from human occupancy, drafts or exposure to cold air and air of unduly low humidity. The physiological effects of all four of these conditions require further study and the Commission plans to attack them all in order.

1. It has been clearly shown by others that very high temperatures combined with high humidities (corresponding to a wet bulb temperature of 78° and over) produce not only discomfort but definite symptons of physiological derangement, such as a rise in body temperature and pulse rate and a fall in blood pressure. It has not been known whether such symptoms were present under less extreme conditions of overheating, such as ordinarily obtain in occupied rooms, whether they were accompanied by more profound derangements in metabolic processes or to what extent they affect physical and mental efficiency.

2. The trend of physiological research has been to throw serious doubt upon any effect whatever of carbon dioxide, organic effluvia and other chemical constituents of the air of occupied rooms. This problem, too, we have felt required further study before final judgment could be pronounced.

3. It is believed by many physicians and laymen that chill from exposure to drafts and low temperatures, particularly when it affects the habitual dweller in an overheated atmosphere, is a primary factor in inducing colds, bronchitis, pneumonia and other bacterial infections. On the other hand, equally qualified observers maintain that the temperature factor in such diseases is a relatively minor one. It is important to know, not as an opinion but as a result of definitely planned experiments, how serious living in warm rooms with subsequent exposure to chill really is, in its effect upon the human mechanism.

4. Finally, it is claimed in many quarters that dry air *per se* at either high or moderate temperatures is harmful to the mucous membranes, promoting infections and glandular enlargement and conduces to nervousness and interferes with concentrated work. So far as we are aware this opinion rests on no definite, tangible evidence but it is sufficiently plausible to demand careful study.

These are the four fundamental problems which underlie the formulation of biological standards for air conditioning. The task of meeting these standards by practical ventilation involves mechanical problems of equal complexity.

5. First of all, among the mechanical problems, is the question whether the admission of untempered outdoor air through open windows or through special deflecting window ventilators or through cloth screens is an adequate and sufficient mode of air conditioning. It is claimed that such simple methods of ventilation are superior to the most elaborate ducts and fans; and it is claimed with equal vigor by others that they are inadequate and insufficient for the ordinary school or factory. It is important to determine the limit of usefulness of such devices.

6. If, and when, the admission of tempered air is necessary, the next question which arises is as to whether it is most effective and economical to supply it from local inlets, supplied with heating coils, by gravity or to distribute it from a central point by fans.

7. The answer to both of the last questions will be affected by the conclusions reached as to the value and field of application of the new process of recirculation or using over and over of the same air, after washing and conditioning, since if this procedure proves generally satisfactory it may easily prove to have important economic advantages over any other system.

8. Finally there remain to be worked out details of the most efficient practice in air distribution within the room, the respective advantages of upward and downward and lateral flow and the proper proportion of inlets to occupants under various conditions.

These eight biological and mechanical problems are the principal elements in the investigation planned by the New York State Commission. Our studies of the first two of them have reached a point of practical completion and it is in regard to these two that we are prepared to make a preliminary report at this time.

THE CITY COLLEGE EXPERIMENTS.

For the study of the fundamental physiological problems involved in the establishment of ventilation standards the Commission equipped two rooms in which subjects could be kept for various periods of time under known air conditions and their physiological and psychological conditions carefully observed. These rooms were placed at our disposal through the courtesy of the Trustees of the College of the City of New York. The Board of Education of the City of New York has also coöperated with the Commission by providing in one of its new school buildings for two classrooms in which almost all possible mechanical variables of air supply and exhaust can be compared and in these classrooms, now nearly ready for occupation, the engineering aspects of the subject will be studied.

The City College plant which has now been in operation for nearly a year includes two rooms one of which, used as an Observation Room or Experiment Chamber, is 10 ft. by 14 ft. by 10 ft. high. The second room, used to house the apparatus which controls the conditions in the Observation Room, is 11½ ft. by 14 ft. by 11 ft. high. The Apparatus Room itself is under sufficiently close control to serve for certain experimental purposes.

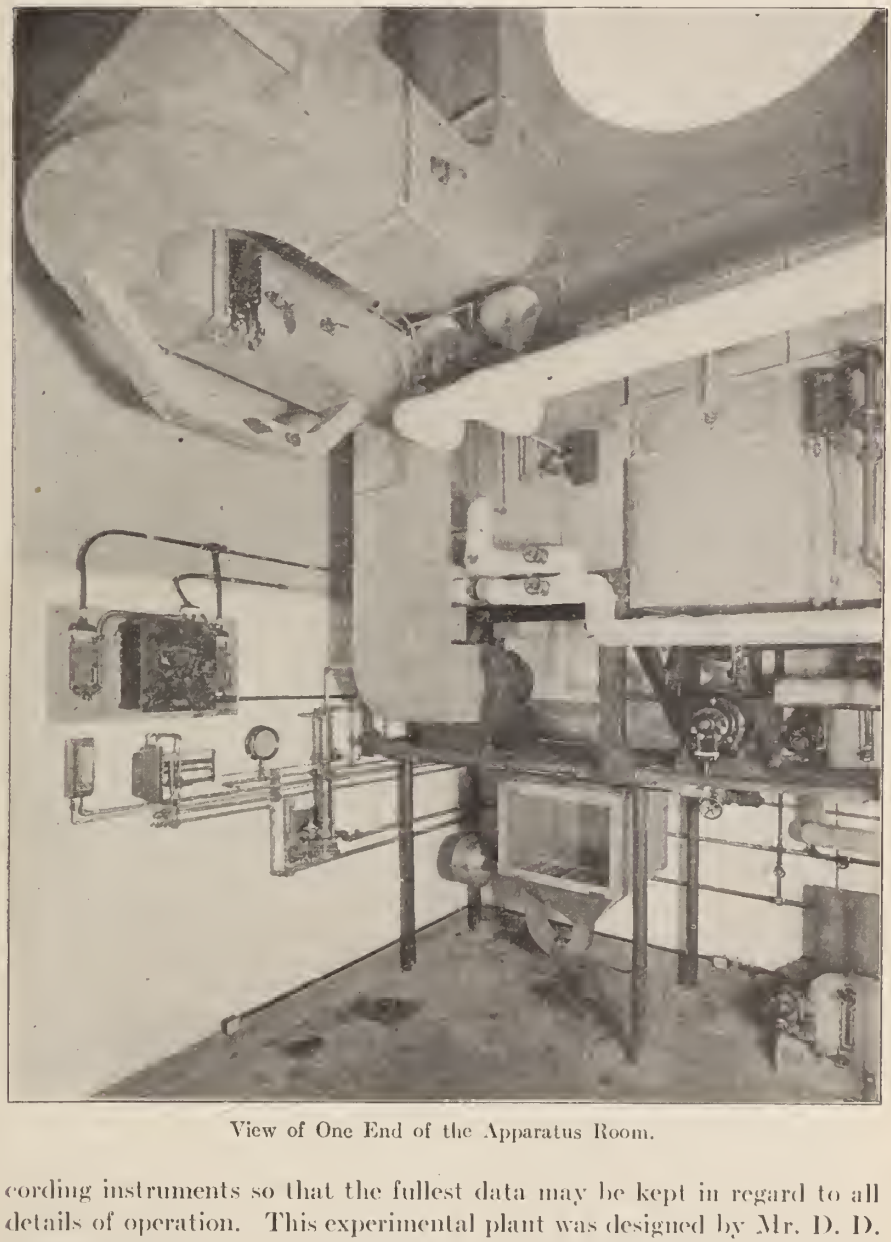
The general equipment of the apparatus room is as follows: Air is drawn in from outdoors by a Sirocco blower. The incoming air can be made to pass over a double bank of Vento heaters, which temper the air, or can be by-passed into the adjacent Warren Webster Air Washer and Humidifier where the air can be humidified and cleaned by spray nozzles and eliminator plates. Next to the air washer is a set of secondary Vento coils used for re-heating the air. This air then passes into the Observation Room through any or all of four register openings at different levels in a main, vertical duct.

The observation room is insulated with two inches of cork covered with quarter-inch cement and plaster finish, painted. Ammonia cooling coils on three sides operated by a 4½ ton refrigerating plant can be used to cool the room, and an evaporating pan permits the direct addition of moisture. The air in the room can also be heated directly by means of a small radiator. Electric fans produce local air currents when needed.

The air is exhausted from the room through registers at four different levels in a vertical duct on the same side of the room through which air enters, the suction being created by a Sirocco vent fan. The exhausted air can be either discharged through a branch duct to the roof or it can be passed back over the suction fan and recirculated through the room.

The refrigerating plant is connected up with the air washer so that by the use of a centrifugal pump to the sprays and a rotary pump at the cold water tank, chilled water can be pumped through the sprays.

The heaters, wash water temperature, evaporating pan, etc., are controlled by thermostats, and the apparatus throughout is fitted with recording instruments so that the fullest data may be kept in regard to all details of operation. This experimental plant was designed by Mr. D. D. Kimball.



View of One End of the Apparatus Room.

In the routine experiments which have been carried on continuously since December 8, 1913, four subjects have generally been placed in the observation room for periods varying from three and a half to eight hours a day. Sometimes the same squad of four has been under observation for a week only, sometimes for as long as six weeks, air conditions being varied from day to day or from week to week, and in one experiment being changed in the middle of the day. In all, 93 different subjects have been under observation, all of them young men and almost all students of the City College or of neighboring institutions.

View of Observation Room.

Observation of the pulse and blood pressure and typewriting operation test under way.

The physiological condition of the subjects was determined at the beginning and the end of the day's routine and at intermediate periods by observations of body temperature, blood pressure and pulse, standing and reclining, and rate of respiration. During certain of the experiments more elaborate studies were made of the return of the pulse to its normal rate after physical work, of the respiratory quotient, of the carbohydrate and protein metabolism, of the size of the dead space of the respiratory passages, of the amount of heat produced by the body, of the constitution of the air in the alveoli of the lungs and hence of the acidosis of the blood, of the duration of digestion, of the dissociation of the oxyhemoglobin of the blood, and of the specific gravity and the freezing point of the urine.

The amount of physical work performed under various conditions was measured by the use of a Krogh bicycle ergometer and by a simple apparatus in which dumbbells were successively raised and lowered through a known height, the completion of each excursion being recorded by a lever attached to a counter.

The quantity and quality of intellectual product per unit of time under different air-conditions was exhaustively studied by a long series of psychological tests including naming of colors, and opposites, cancellation, addition, mental multiplication, typewriting, and grading specimens of handwriting, poetry and English composition.

Finally in two series of experiments the effect of air conditions upon appetite was studied by serving standard lunches to the subjects in the observation room and determining the number of calories consumed.

Seven distinct series of experiments have been completed to date and it is upon these seven series that the tentative conclusions which follow will be based.

Series I extended for eleven weeks, from December 8 to December 20, 1913, and from January 27 to March 27, 1914. Eleven squads of four subjects were observed, each for a week at a time, the period of observation being in each case 2.30 to 6 p. m. Three air conditions were studied varying from day to day: 68 degrees with 50 per cent. relative humidity, 86 degrees with 75 to 80 per cent. relative humidity and 86 degrees with 75 to 80 per cent. relative humidity but relieved by electric fans in the observation room. An ample fresh air supply of 45 cubic feet per minute per person was provided throughout. The observations made included body temperature, respiration, standing and reclining pulse and blood pressure as physiological tests and naming colors and opposites, cancellation, addition, mental multiplication and typewriting as psychological tests.

Series II lasted for eight weeks from March 30 to May 29, four squads of four subjects working for two weeks each from 2.30 to 6 p. m. Three air variables were compared: 68 degrees with 50 per cent. relative humidity and 45 cubic feet of air supply, 86 degrees with 80 per cent. relative humidity and 45 cubic feet of air supply, and 86 degrees with 80 per cent. relative humidity and no air supply. In this last condition the air in the observation room remained entirely stagnant and the carbon dioxide at 6 p. m. averaged 32 parts per 10,000. The air conditions were not varied each day but each condition was maintained for a period of five consecutive days. The tests used were the same as in Series I.

Series III covered six weeks from June 8 to July 17. Four subjects were used throughout the series and were under observation from 8 a. m. to 4 p. m. Conditions were maintained uniform for five consecutive days. Six air conditions were studied; 68 degrees with 50 per cent. relative humidity with and without air supply, 77 degrees with 60 per cent. relative humidity and 45 cubic feet air supply, 86 degrees with 80 per cent. relative humidity with and without air supply, and 88 degrees with 80 per cent. relative humidity and no air supply but with room fans running. The same physiological tests used in Series I and II were applied with the addition of tests for oxygen consumption, respiratory quotient, heat production, freezing point and specific gravity of the urine and skin sensitivity.

For the simpler psychological tests used in Series I and II there were here substituted the grading of standardized specimens of handwriting, poetry and English composition. As a rule, the first three days of the week were given over to these psychological tests, the last two being devoted to physical work with the bicycle ergometer and the dumbbells. Standard lunches were served to the subjects in this series.

Series IV was devoted to intensive physiological studies of two subjects who were under observation, as a rule, from 8.30 a. m. to 3.30 p. m. for a period of five weeks from July 27 to August 15 and from August 24 to September 4. Five air conditions were maintained, each for five successive days as follows: 68 degrees with 50 per cent. relative humidity and no air supply; 75 degrees with 50 per cent. relative humidity and no air supply; 76 degrees with 60 per cent. relative humidity and 45 cubic feet of air; 80 degrees with 80 per cent. relative humidity and no air; 86 degrees with 80 per cent relative humidity and 75 cubic feet of air. The physiological tests were the same as those used in Series III with the addition of determinations of the dead space in the lungs, the carbon dioxide content of the alveolar air and the rate of pulse recovery after physical exercise.

Series V was a short experiment of six days (August 17 to 22). Four subjects were under observation from 9 a. m to 4 p. m. The entire diet of the subjects was controlled so as to be creatin-free, beginning two days before the commencement of actual work, and all urine voided for eight days was collected and analyzed for creatinin. The work of the subjects in the room included mental multiplication for small pay (with an option of reading a novel without pay), and typewriting. The latter could be done or not, as the subjects chose, at no loss whatever to them beyond the loss of training in typewriting. Physiological observations included only body temperature, a record of the water drunk during the day and studies of protein metabolism. The air conditions were six in number: 86 degrees and 80 per cent. relative humidity, 75 degrees and 50–60 per cent. relative humidity, 68–70 degrees and 50–60 per cent. relative humidity, each temperature condition being studied with an air supply of 45 cubic feet per capita and with no fresh air supply.

Series VI extended for five weeks from September 8 to October 10. Four different subjects were placed in the observation room each week making twenty subjects in all. The period of observation was from 9 a. m. to 4 p. m. Two air conditions were studied, 68 degrees and 75 degrees, the air being stagnant and the relative humidity 50 per cent. throughout the period.

During the first week the cool temperature was maintained throughout, during the second and third weeks a change from cool to warm or *vice versa* was made at noon, during the last two weeks three cool days were followed by three warm days or *vice versa.* This experiment was devoted to psychological tests, the results of maximal effort in addition being compared and inclination being tested by optional choices between mental multiplication for pay and novel reading and between typewriting and idling.

Series VII covered four weeks from October 12 to November 6. Four subjects were observed from 9 a. m. to 4 p. m. Four air conditions were studied, changing daily, 68° with and without air supply and 75° with and without air supply. The relative humidity was 50 per cent. throughout. This experiment was a study of ability and inclination to do physical work. Maximal physical effort (on the bicycle ergometer) was required for two one minute periods and the rate of pulse recovery thereafter was observed. For the principal part of the day the subjects were allowed to choose between lifting dumbbells for pay and idling. Physiological observations included determinations of body temperature, pulse and blood pressure. Standard lunches were served and a measure of appetite obtained.

RESULTS OBTAINED IN REGARD TO THE EFFECT OF TEMPERATURE AND HUMIDITY UPON PHYSICAL AND MENTAL CONDITION AND EFFICIENCY.

The first of the problems before the Commission concerned the exact effects upon the human mechanism of high temperature combined with high humidity and particularly of such moderately but not excessively high temperatures as are commonly found in schools and workplaces. This question our investigations have answered with reasonable fulness.

Broadly speaking, we have studied three temperature conditions: 86° with 80 per cent. relative humidity, 75° with 50 per cent. relative humidity, and 68° with 50 per cent. relative humidity. These points correspond to wet bulb temperatures of 81°, 63°, and 57°.

The physiological and psychological effects of these three air conditions may be briefly summarized as follows.

1. *Body Temperature.*—The relation between the temperature of the observation room and the average rectal body temperature of the subjects is shown in Table I and Fig. I.

Each of the figures in Table I and succeeding tables is the average of from eight to eighty individual observations. Table II shows the number of observations actually made and applies approximately to the records of pulse, blood pressure and respiration as well as body temperature.

TABLE I.

RELATION BETWEEN ROOM TEMPERATURE AND BODY TEMPERATURE.

Average Rectal Temperature of all Subjects, Degrees C.

Series.	Hour.	Room condition, Degrees F.			
		68°.	75°.	86°. Room fans.	86°.
I.	2 p. m.	37.33		37.32	37.32
	4 p. m.	36.83		37.41	37.42
	6 p. m.	36.86		37.55	37.47
II.	2 p. m.	37.30			37.41
	4 p. m.	36.80			37.32
	6 p. m.	36.50			37.40
III.	8 a. m.	37.12	36.83	36.98	36.86
	4 p. m.	36.52	37.02	37.37	37.28
IV.	8.30 a. m.		36.76		37.11
	3.30 p. m.		36.58		37.08
V.	8 a. m.	37.53	37.45		37.61
	12 Noon	36.89	37.03		37.58
	3.30 p. m.	36.88	37.01		37.56
VI.	9 a. m.	37.15	37.18		
	12 Noon	36.73	36.83		
	1 p. m.	36.92	37.06		
	3.30 p. m.	36.96	37.10		
VII.	9 a. m.	36.99	37.05		
	4 p. m.	36.73	36.96		

The differences in body temperature are slight but significant. In every one of the six series where subjects were observed with a room temperature of 68° the average body temperature fell by from .19° to .80° during the period of observation.* In five series where a temperature of 75° was used the body temperature rose in one case by .19° and fell in four cases by from .08° to .44.° In the series in which a temperature of 86° was maintained, the body temperature rose by .15° and .42° in two and fell by from .01° to .05° in the other three. Curiously enough the two series in which

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* Throughout this paper we have expressed room temperatures in Fahrenheit degrees and body temperatures in Centigrade degrees as a concession to popular usage.

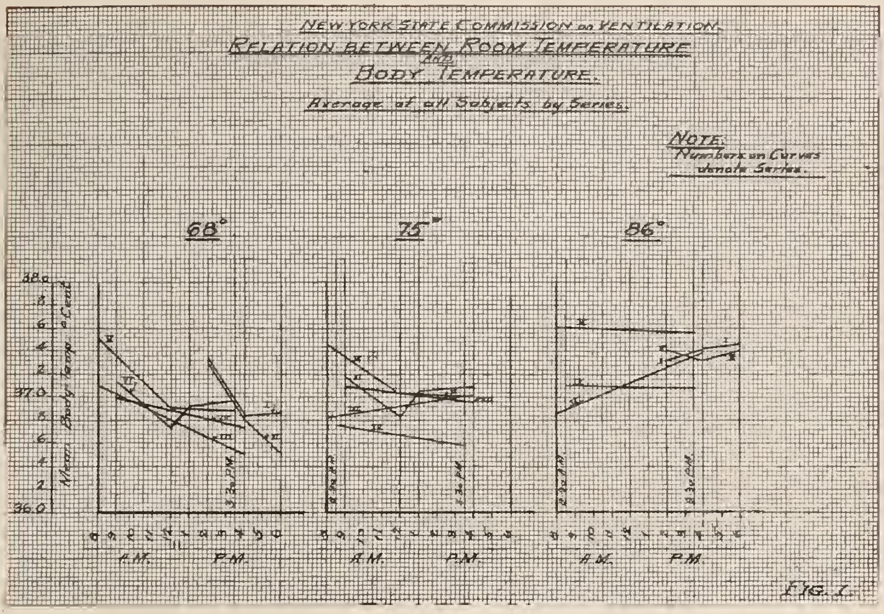


Fig. I.

TABLE II.

NUMBER OF OBSERVATIONS ON WHICH AVERAGES OF FUNDAMENTAL PHYSIOLOGICAL OBSERVATIONS ARE BASED.

Series.	Air conditions Degrees F.			
	68°.	75°.	86°. Fans.	86°.
I.	72		28	76
II.	80			80
III.	22	19	22	25
IV.		10		10
V.	8	8		8
VI.	62	42		
VII.	40	40		

room fans were used both showed a considerable average increase of .23° and .39° respectively.

The different results obtained in different cases are influenced to a considerable extent by the initial body temperatures of the subjects at the time of entering the chamber. With initial high body temperatures for example, a high room temperature produced less increase and a low room temperature more decrease. Fig. II illustrates the close relation between body temperature at 8 a. m. and the mean outdoor temperature for the twelve-hour period preceding, for six weeks in July and August. Later studies suggest that in the cold months the relation is not so close. This would naturally be expected since in cold weather the night has been spent under artificial conditions.

The final body temperature attained by the subjects in the observation room at the end of each day are specially significant. With a 68° room temperature the final average body temperature ranged between 36.50° and 36.96° and averaged 36.73°. With a room temperature of 75° the final average body temperature ranged between 36.58° and 37.10° and averaged 36.99°. With a room temperature of 86° the final average body temperature ranged between 37.08° and 37.56° and averaged 37.41°.

It seems clear from these experiments that the body temperature regulating mechanism is less perfect than is generally assumed and that rectal temperature is distinctly affected by even such relatively slight differences in room temperature as that between 68° and 75° with a relative humidity of 50 per cent. in each case.

2. *Pulse.*—The pulse of the subjects was recorded both reclining and standing. The subject reclined quietly on a couch for about three minutes. The pulse was counted and the subject then stood up and the second count was made from one to three minutes later.

The results of the reclining pulse determinations are shown in Table III for Series I, II, III, and VII. The records for the last series are not significant for the reason that the subjects were doing physical work up to 2.00 p. m. and the 3 p. m. pulse is, therefore, unduly high. The other three series show a marked drop of from 11 to 13 beats in the average for the subjects observed at 68° while those exposed to temperatures of 75° or 86° showed in three cases a drop of 2 to 5 beats and in three cases an increase of 1 to 4 beats. (See Fig. III.)

The subjects kept for several hours at 68° showed a distinct decrease in heart rate just as they showed a distinct fall in body temperature, while at either 75° or 86° the heart rate like the temperature either rose or at least fell only slightly.

The final heart rate at the end of the period averaged for all observations 66 beats at 68°, and 74 beats at 86°. The rate for 75° in series III was even higher, 81 beats, but this cannot fairly be compared with the other figures since it is based only on a single series. Within Series III itself, the 75° rate is slightly lower than that observed at 86°.

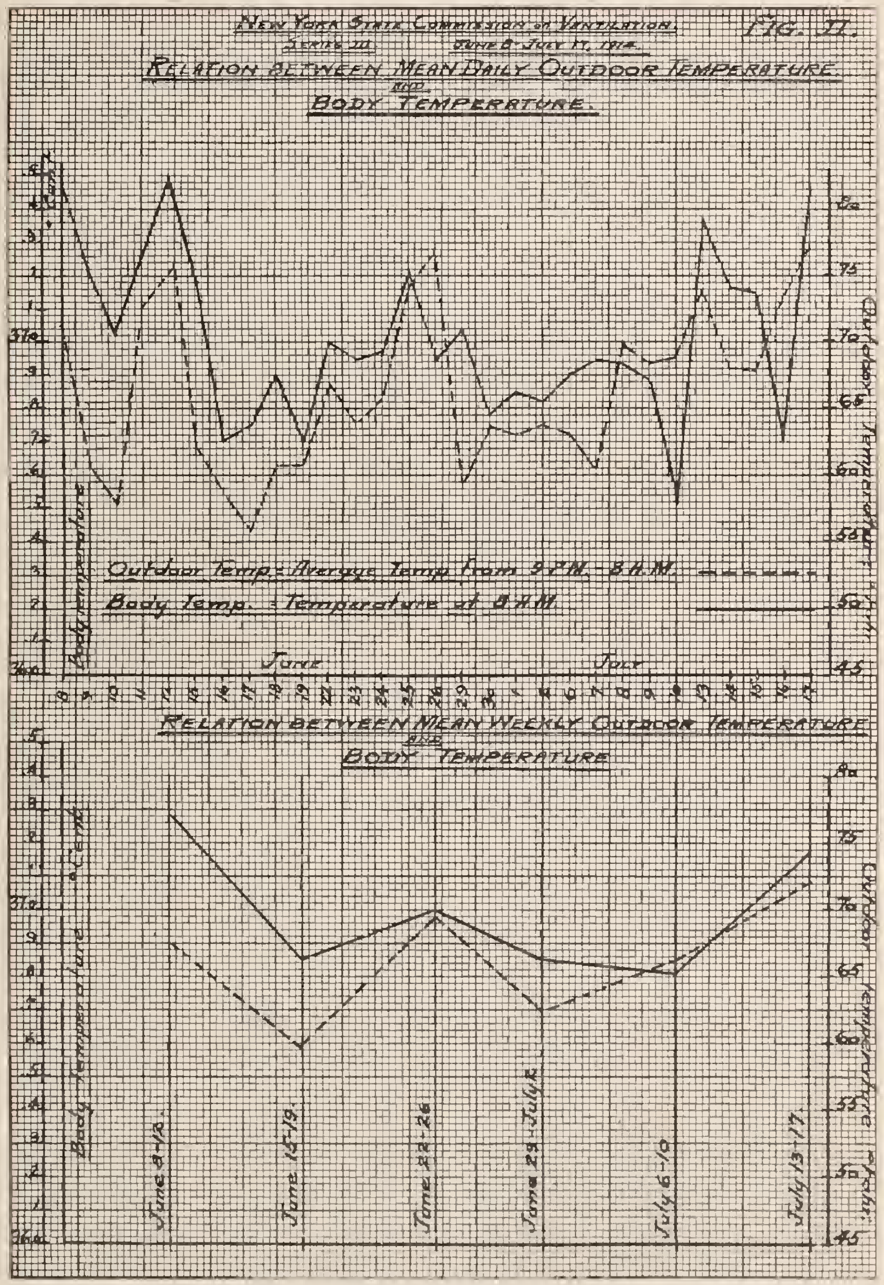

New York State Commission on Ventilation.
Series III June 8–July 17, 1914.
Fig. II.
Relation between Mean Daily Outdoor Temperature and Body Temperature.
Outdoor Temp = Average Temp from 9 P.M.–8 A.M.
Body Temp. = Temperature at 8 A.M.
Body temperature
Outdoor temperature
37.0
36.0
80
75
70
65
60
55
50
45
June
July
8
9
10
11
12
15
16
17
18
19
22
23
24
25
26
29
30
1
2
6
7
8
9
10
13
14
15
16
17
Relation between Mean Weekly Outdoor Temperature and Body Temperature
Body Temperature °Cent.
Outdoor temperature °Fahr.
June 8–12
June 15–19
June 22–26
June 29–July 2
July 6–10
July 13–17

Fig. II.

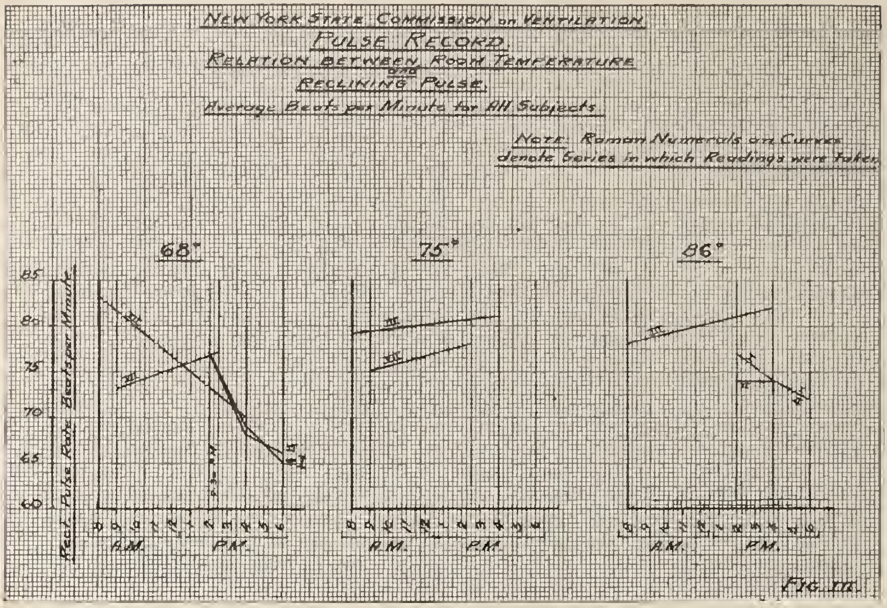


Fig. III.

TABLE III.

RELATION BETWEEN ROOM TEMPERATURE AND PULSE, RECLINING.

AVERAGE READING PER MINUTE FOR ALL SUBJECTS.

Series.	Hour.	Room conditions.			
		68°.	75°.	86° Fans.	86°.
I.	2 p. m.	77		73	77
	4 p. m.	69		74	74
	6 p. m.	65		70	72
II.	2 p. m.	77			74
	4 p. m.	68			74
	6 p. m.	66			72
III.	8 a. m.	83	79	82	78
	4 p. m.	70	81	83	82
VII.	9 a. m.	73	75		
	2.30 p. m.	77	78		

3. *Increase in Heart Rate on Standing.*—The increase in heart rate on assuming a standing posture after a reclining one (summarized in Table IV) also shows a striking relation to room temperature.

Series VII may again properly be excluded from consideration on account of the evident effects of recent physical work. In the other three series the average excess of standing over reclining pulse at the end of a period of observation at 68° ranged from 9 to 15 beats and averaged 10 beats. At 86° on the other hand the corresponding figures ranged from 23 to 26 beats and averaged 25 beats. At 75° it averaged 24 beats.

Still more important perhaps is the fact brought out in Figure IV that the increase of heart rate on standing fell off progressively while the subject was in the room at 68° (an average decrease of 7 beats for all observations) while it decreased by 3 beats at 75° and increased (by an average of 7 beats for all observations) when the room was at 86°.

TABLE IV.

RELATION BETWEEN ROOM TEMPERATURE AND INCREASE OF STANDING PULSE OVER RECLINING.

Average Reading per Minute for All Subjects.

Series.	Hour.	Room conditions.			
		68°.	75°.	86° Fans.	86°.
I.	2 p. m.	12		13	13
	4 p. m.	10		24	19
	6 p. m.	10		23	23
II.	2 p. m.	19			18
	4 p. m.	12			25
	6 p. m.	9			26
III.	8 a. m.	24	27	25	23
	4 p. m.	15	24	26	26
VII.	9 a. m.	18	18		
	2.30 p. m.	20	20		

4. *Pulse Recovery after Physical Work.*—Observations made during the course of Series IV suggested that under warm atmospheric conditions the pulse returned less rapidly to normal after being increased by vigorous physical work than was the case when the room temperature was low. This point was studied more carefully in Series VII and the results have been plotted in Fig. V.

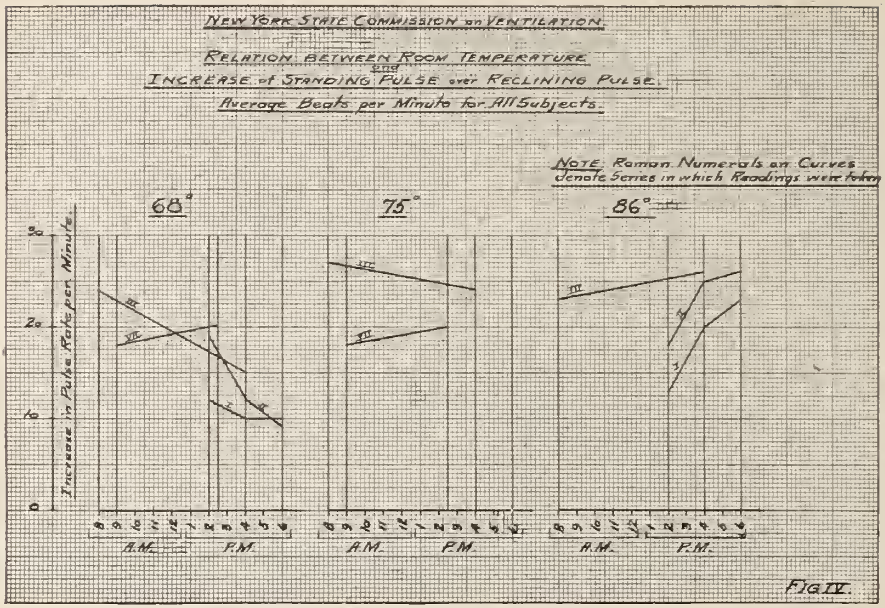

New York State Commission on Ventilation.
Relation between Room Temperature and Increase of Standing Pulse over Reclining Pulse.
Average Beats per Minute for All Subjects.
Note: Roman Numerals on Curves denote Series in which Readings were taken
68°
75°
86°
Increase in Pulse Rate per Minute.
30
20
10
0
III
VII
I
II
A.M.
P.M.
Fig IV.

Fig. IV.

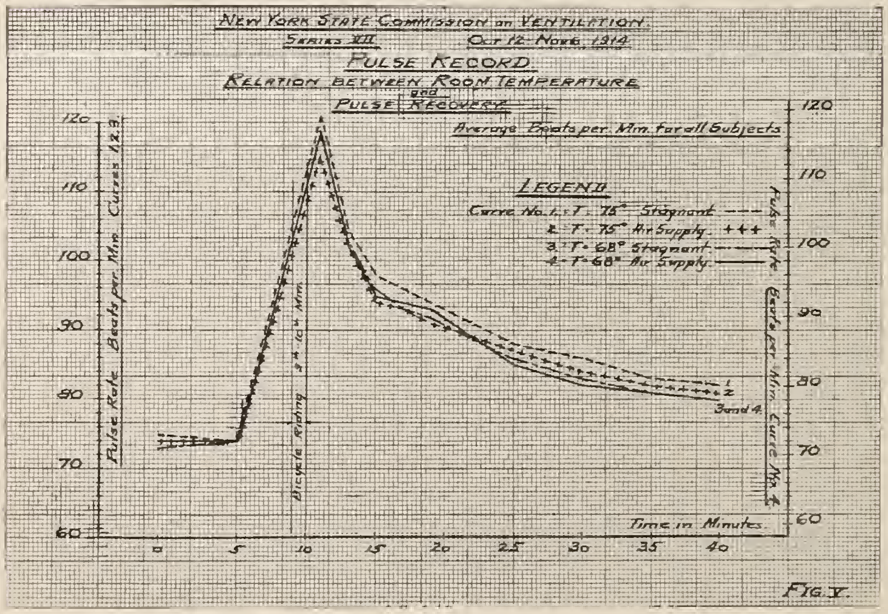

New York State Commission on Ventilation.
Series VII Oct 12 - Nov 6, 1914
Pulse Record.
Relation between Room Temperature and Pulse Recovery.
Average Beats per Min. for all Subjects
Legend
Curve No. 1. - T. 75° Stagnant ----
2. - T. - 75° Air Supply. +++
3. - T. - 68° Stagnant
4. - T. - 68° Air Supply.
Pulse Rate Beats per Min. Curves 1, 2, 3
Pulse Rate Beats per Min. Curve No. 4
Bicycle Riding 5 to 10 Min.
120
110
100
90
80
70
60
1
2
3 and 4
Time in Minutes.
0
5
10
15
20
25
30
35
40
Fig. V.

Fig. V.

Each point on this curve represents an average of morning and afternoon observations on four subjects for 5 days. The physical work which produced the initial rise in heart rate consisted in riding the bicycle ergometer at full speed for a period of one minute.

The differences are of course slight but a distinctly slower recovery is manifest under the warm atmospheric condition.

5. *Systolic Blood Pressure.*—The systolic blood pressure, like the pulse, was determined in both reclining and standing positions. The auscultation method with the Janeway sphygmomanometer was used and the results are summarized in Table V.

Somewhat the same phenomenon is manifest here as in the case of the other observations, although the effect of temperature is less marked. The average of all blood pressures taken at the end of the observation period was 116 mm. for 68° and 75° and 112 mm. for 86°.

The change of blood pressure on assuming the standing position shows no apparent relation to external temperatures.

TABLE V.

RELATION BETWEEN ROOM TEMPERATURE AND SYSTOLIC BLOOD PRESSURE, RECLINING.

AVERAGE READING FOR ALL SUBJECTS.

Series.	Hour.	Room conditions.			
		68°	75°.	86°. Fans.	86°.
I.	2 p. m.	117		113	116
	4 p. m.	113		110	111
	6 p. m.	114		110	111
II.	2 p. m.	122			116
	4 p. m.	116			111
	6 p. m.	117			112
III.	8 a. m.	112	114	117	111
	4 p. m.	114	115	115	114
VII.	9 a. m.	119	117		
	2.30 p. m.	119	117		

6. *The Crampton Value.*—The Crampton Value suggested by Dr. C. Ward Crampton (Transactions, Fourth International Congress on School Hygiene, V., 555) as a measure of vaso-motor efficiency, expresses the

relation between the rise in heart beat and the decrease or increase in blood pressure on passing from a reclining to a standing position. A Crampton value of 100 means that the heart rate on standing up increases by less than 5 beats and the blood pressure increases by 10 mm. while a 0 value corresponds to an increase in heart rate of over 40 beats and a fall in blood pressure of more than 8 mm.

Our experiments indicate that room temperature exercises a marked effect upon this Crampton value (Table VI. and Fig. VI). At a room temperature of 68° the Crampton value rises in every case (except in Series VII where the effect of previous physical work complicates the observations) by from 7 to 23 points, (averaging 15 points). With a room temperature of 75° there was a rise of 2 points. With a room temperature of 86°, with room fans running, the Crampton value rose in one series by three points and fell in the other by two points. With a room temperature of 86° without room fans the Crampton value fell in each series by from 2 to 15 points (general average 6 points).

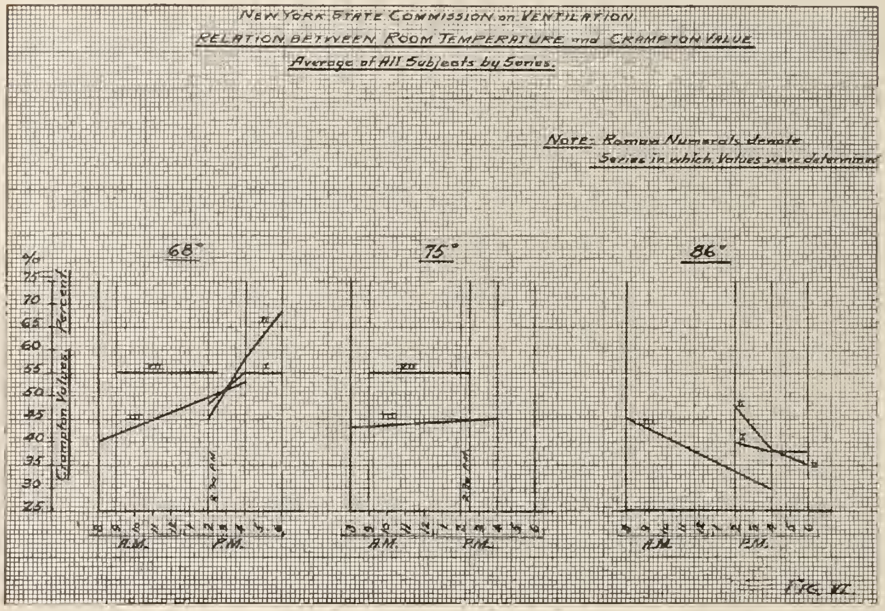


Fig. VI.

The final average Crampton value attained was 60 for the 68° condition, 45 for the 75° condition, 40 for the 86° condition with fans, and 35 for the 86° condition without fans.

Evidently a room temperature of either 75° or 86° distinctly decreases the Crampton value, mainly, as shown by previous tables, because it leads to a greater increase in pulse rate on standing without a corresponding greater increase in blood pressure.

This is the first of the physiological reactions in which the operation of electric fans in the observation chamber produced any apparent effect. There were five of these fans in the room, 12 inches in diameter running at full speed in front of and 2–4 feet from each of the subjects or the observer in charge and directed toward his face. We expected that the cooling effect of these fans would be clearly manifest but neither body temperature, pulse nor blood pressure seemed to be affected as may be seen by reference to Tables I, III, and V. The difference of 5 points in the Crampton value in favor of the fans is within the limits of experimental error.

TABLE VI.

RELATION BETWEEN ROOM TEMPERATURE AND CRAMPTON VALUE (BASED ON THE DIFFERENCES BETWEEN STANDING AND RECLINING PULSE AND STANDING AND RECLINING BLOOD PRESSURE).

Average of All Subjects.

Series.	Hours.	Room conditions.			
		68°.	75°.	86° Fans.	86°.
I.	2 p. m.	48		45	40
	4 p. m.	55		33	38
	6 p. m.	55		43	38
II.	2 p. m.	45			48
	4 p. m.	58			38
	6 p. m.	68			35
III.	8 a. m.	40	43	35	45
	4 p. m.	53	45	38	30
VII	9 a. m.	55	55		
	2.30 p. m.	55	55		

The fact that the fans played only on the faces and upper parts of the bodies of the subjects may probably account for their slight effect. The discomfort of the subjects in the chamber was notably relieved by the fans as will be shown below.

7. *Respiration.*—The respiration of the subjects was counted for one minute in the routine physiological experiments but the results summarized in Table VII failed to show any relation to the temperature of the observation room.

TABLE VII.

RELATION BETWEEN ROOM TEMPERATURE AND RESPIRATION RATE

Average per Minute for All Subjects.

Series.	Hour.	Room conditions.			
		68°.	75°.	86° Fans.	86°.
I.	2 p. m.	17.5		17.5	17.5
	4 p. m.	16.6		18.4	16.3
	6 p. m.	17.2		18.2	16.5
II.	2 p. m.	18.3			18.2
	4 p. m.	17.8			17.9
	6 p. m.	17.8			18.2
III.	8 a. m.	18.9	20.3	21.1	18.5
	4 p. m.	19.1	21.1	24.8	21.2

8. *Special Physiological Studies.*—Experiments in Series III, IV, and V were devoted to intensive studies of the physiological condition of three groups of subjects with special view to the detection of any fundamental changes in metabolism resulting from atmospheric conditions. The principal observations made in these experiments, aside from those previously discussed, are listed below. The full data are too lengthy to be given here. All this physiological work of the Commission has been under the special direction of Prof. Frederic S. Lee.

(a) The Dead Space in the Lungs.

It might be expected that a high room temperature would lead to increase in dead space, providing for greater loss of water and thus of heat, but this does not seem to be the case.

(b) Acidosis.

Barcroft has made some observations which suggest that high atmospheric temperatures tend to produce an acidosis in the blood leading to an interference with the action of the hæmoglobin and possibly a decreased oxygen supply to the tissues. Such a condition would lead to a decreased percentage of carbon dioxide in the alveolar air but no such decrease was observed. Direct determinations of the dissociation of the blood by Barcroft's method also yielded negative results.

(c) Respiratory Quotient.

No changes in the ratio of oxygen and carbon dioxide in the alveolar air were observed as a result of varying air conditions.

(d) Rate of Digestion.

The progress of the digestive process was measured by determining the rate of oxygen consumption before breakfast and for five hours after. No significant variations were apparent.

(e) Heat Production.

The heat production of the body was measured by determinations of oxygen consumption on a fasting day (no food taken till 3 p. m.). No effect of atmospheric conditions was apparent.

(f) Creatinin in the Urine.

An increase in creatinin in the urine when the subject was on a creatin-free diet would indicate increased protein metabolism within the body. No such increase was apparent as a result of changes in atmospheric conditions.

(g) Freezing Point and Specific Gravity of Urine.

No change in these respects were indicated by our experiments.

(h) Skin Sensitivity.

A small series of determinations of sensitivity of the skin by the method of Martin failed to show any relation to atmospheric conditions.

It appears, therefore, from our experiments that neither the general mechanism of respiration, nor the dissociation coefficient of the oxyhæmoglobin of the blood, nor the fundamental metabolic and excretory activities of the body, nor the sensitivity of the skin are affected by variations in atmospheric temperature and humidity between the limits of 68° with 50 per cent. relative humidity and 86° with 80 per cent. relative humidity.

9. *Measurements of the Quantity and Quality of Certain Intellectual Products.*—In series I and II the mental efficiency of the subjects was measured by the psychological tests of color-naming, naming opposites, addition, cancellation, mental multiplication and typewriting. Space will not permit a discussion of the detailed technique, but the average results for each temperature-condition are summarized in Table VIII. In naming colors and opposites the figure represents the time taken to complete the work so that the lower the value, the better the product. In addition, cancellation, mental multiplication and typewriting the figure represents a score in which time and errors are arbitrarily combined, and the higher the value, the better the product.

In Series III, a new type of psychological test was introduced by Professor Thorndike which measures more complex intellectual powers and has the added advantage that the subject has no way of checking up his own performance as he goes along. A series of specimens of handwriting, of rhymed couplets and of short essays was prepared and their relative caligraphic and literary value was determined by having them graded by a score or more of competent judges. These specimens were then given to the subjects in the observation room and they were told to grade them according to their own judgment. The average deviation of their gradings from the true values attached to the specimens in question by the average opinion of the score of experts gives (inversely) a measure of the quality of the judgments made by the subjects under various atmospheric conditions.

Table VIII shows no deterioration in the quantity and quality of the products under the hot conditions. On the contrary, in addition, mental multiplication and grading handwriting there is a slight advantage in favor of the hot conditions.

The results of the grading of specimens of poetry and prose composition are not yet fully available, the working up of such data requiring a large amount of computation, but the facts so far available are in agreement with those of Table VIII.

TABLE VIII.

RELATION BETWEEN ROOM TEMPERATURE AND PSYCHOLOGICAL MAXIMUM EFFORT TESTS.

AVERAGE OF ALL SUBJECTS.

Series.	Test.	68°.	75°.	86° Fans.	86°.
I.	Color naming (time)	49		48	49
	Naming opposites (time)..........	57		54	57
	Addition (score) ...	71		73	73
	Cancellation (score)	102		101	101
	Mental mult. (score)	54		56	56
	Typewriting (score)	86		89	86
II.	Addition (score) ...	86			88
	Cancellation (score)	145			144
	Mental mult. (score)	118			121
	Typewriting (score)	310			309
III.	Grading Handwriting Average deviation from mean. Low value, better score	1.43	1.38	1.31	1.36
VI.	Addition (Max. effort) score.......	420	418		

10. *Tests of Inclination to Do Mental Work.*—In Series V and VI, we have studied a different and extremely significant factor—the inclination to do

more or less arduous mental work when a choice is open between doing such work and idleness.

In the experiments of Series V, the four subjects in the observation room were given at different periods in the day one of three options. At certain hours they were allowed to do typewriting if they desired and at certain other hours to read a scientific work and at certain other hours to do mental multiplication. The alternatives to typewriting and heavy reading were idling, in the latter case conversation being prohibited. The alternative to mental multiplication was reading a novel, and for all mental multiplication the subjects received a small cash bonus so adjusted as to constitute a real but slight incentive.

The results of these experiments are shown in graphic form in Fig. VII, plotted by days. The first and fifth days had a temperature of 86°, the second and fourth a temperature of 75° and the third and sixth a temperature of 68°. The curve for mental multiplication shows a general upward tendency throughout the week as a result of improvement due to practice. Allowing for this all the three forms of mental effort fall on the 86° days and rise on the 68° days while the 75° days occupy an intermediate position (except in the case of the first 75° day in respect to heavy reading).

The experiments in Series VI were carried on under two distinct conditions. During Period A, the observation room was 68° in the morning and 75° in the afternoon or *vice versa.* During Period B, three days at 68° were followed by three days at 75° and *vice versa.* In both periods the subjects were allowed at certain times either to do mental multiplication for pay or to read a novel, and at other times either to typewrite or remain idle.

The results are summarized in Table IX.

TABLE IX.

RELATION BETWEEN ROOM TEMPERATURE AND INCLINATION TO DO MENTAL WORK.

Series VI.	Room temperature.	Mental multiplication (score).	Typewriting (score).
Period A	68°	344	1426
	75°	322	923
Period B	68°	122	877
	75°	208	1152
Average for A and B	68°	233	1157
	75°	265	1038

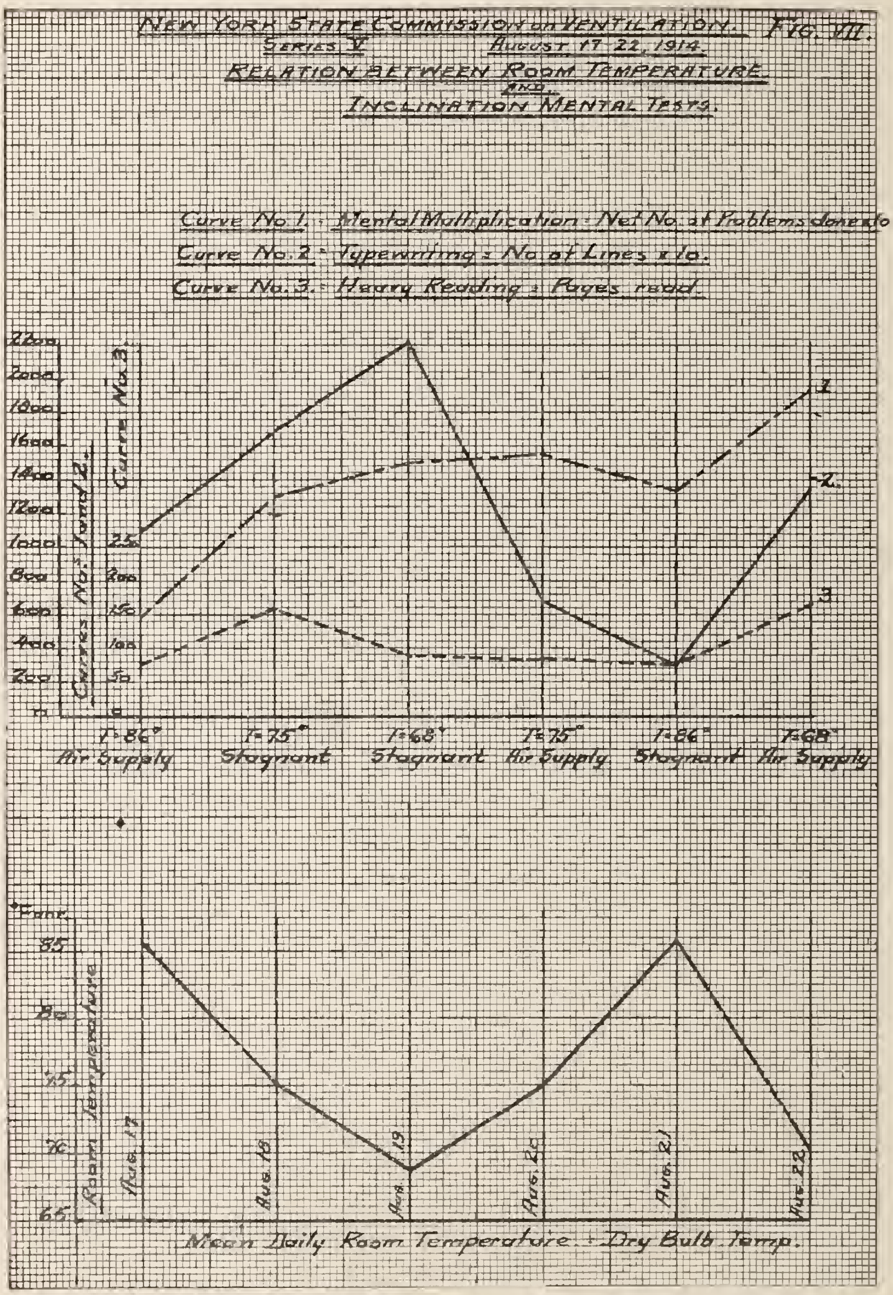

NEW YORK STATE COMMISSION ON VENTILATION.
FIG. VII.
SERIES V
AUGUST 17–22, 1914.
RELATION BETWEEN ROOM TEMPERATURE
AND
INCLINATION MENTAL TESTS.
Curve No. 1. = Mental Multiplication = Net No. of Problems done x 10
Curve No. 2 = Typewriting = No. of Lines x 10.
Curve No. 3. = Heavy Reading = Pages read.
Curves Nos. 1 and 2.
Curve No. 3.
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
250
200
150
100
50
0
1
2
3
T=86° Air Supply
T=75° Stagnant
T=68° Stagnant
T=75° Air Supply
T=86° Stagnant
T=68° Air Supply
°Fahr.
85
80
75
70
65
Room Temperature
Aug. 17
Aug. 18
Aug. 19
Aug. 20
Aug. 21
Aug. 22
Mean Daily Room Temperature = Dry Bulb Temp.

Fig. VII.

Subsequent tests made since this report was presented at Jacksonville have again yielded negative results as to any effect of the 75° condition upon the inclination to do mental work. In these series as a whole, however, the subjects, by their records of comfort, indicated no substantial preference for the 68° as compared with the 75° condition. We purpose to repeat this experiment with more sensitive subjects, particularly with women. It might naturally be expected that while high room-temperatures do not diminish the power to work under pressure (as shown by psychological tests of the product produced at maximal effort) they might influence the inclination to work as shown by the amount accomplished when the incentive to activity is slight. This conclusion is what one would expect from common experience. Under pressure efficient work can usually be accomplished even under most unfavorable external conditions while it is equally true that the children in overheated schools and the workers in overheated factories usually appear to be listless and inactive.

11. *Tests of Inclination to Do Physical Work.*—In Series III and Series VII, data were obtained as to the inclination of the subjects to do physical work under varying air conditions.

In Series III, there were certain periods of the day when the subjects were required to do physical work, either by riding the bicycle ergometer or by lifting dumbbells. They were not pressed, however, and the length of each spell of work was left in considerable degree to the subjects themselves. The result was that four subjects on ten days at 86° accomplished an average of 31,061 foot pounds of work per day and on ten days at 68° an average of 42,820 foot pounds per day, an increase of 37 per cent. As in the case of the psychological tests, however, it is significant to note that the amount of work accomplished during the periods of actual work was 553 and 537 foot pounds per minute respectively, an excess of 3 per cent. for the hot days.

In Series VII, the subjects were paid a small bonus for dumbbell lifting with the option of idling. The same difference appeared, four subjects on ten days at 75° doing an average of 22,075 foot pounds of work per hour and on ten days at 68° an average of 25,250 foot pounds per hour, an increase of 15 per cent.

The cool condition, therefore, showed an excess of 15 per cent. in actual physical work performed over the 75° condition and an excess of 37 per cent. over the 86° condition (Fig. VIII).

12. *Appetite.*—In these same experiments, of Series III and VII, standard lunches were served to the subjects and by weighing the food not eaten the calorific value of the food actually consumed was determined.

In Series III, the luncheons eaten on the 86° days averaged 1,200 calories per subject, and on the 68° days, 1,259 calories, an increase of 5 per

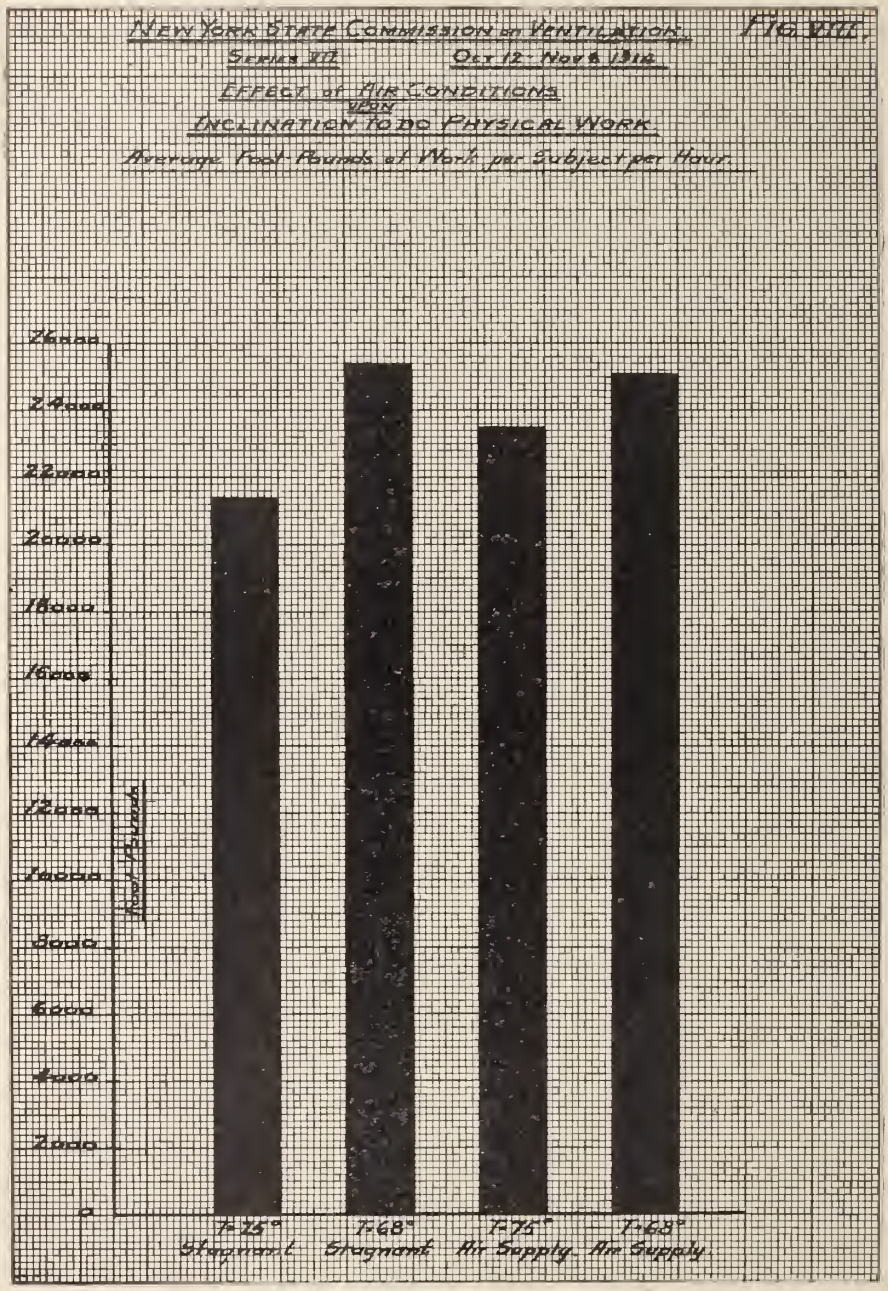

New York State Commission on Ventilation.
Fig. VIII.
Series VII
Oct 12 - Nov 6 1914
Effect of Air Conditions
upon
Inclination to do Physical Work.
Average Foot Pounds of Work per Subject per Hour.
26000
24000
22000
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
Foot Pounds
T-75°
Stagnant
T-68°
Stagnant
T-75°
Air Supply
T-68°
Air Supply

Fig. VIII.

cent. In Series VII, the lunches eaten on the 75° days averaged 1,535 calories and on the 68° days 1,597 calories, an increase of 1.5 per cent. Series III was conducted in the summer and Series VII in the late fall. Much less physical work was done in Series III than in Series VII. Both these facts help to account for the higher food value consumed in the second series.

13. *Opinion of Subjects as to Comfort.*—The subjects were asked on each day at the end of the period to express an opinion as to their sensations of general comfort in the observation room on the following scale:

1. I feel as uncomfortable as I would with a severe headache or an attack of the grippe.
2. My condition is half-way between 1 and 3.
3. I feel about as I usually do at the close of an afternoon of hard mental work.
4. My condition is half-way between 3 and 5.
5. I feel as comfortable as I ever do.

The average results of this vote as to comfort classified according to temperature conditions in the observation room are summarized in Table X below.

TABLE X.

RELATION BETWEEN TEMPERATURE CONDITIONS AND SENSATIONS OF COMFORT.

Average of Votes Expressed on Scale Above.

Series.	68°.	75°.	86° Fans.	86°.
I	3.8		3.2	2.8
II	4.2			3.6
V	4.8	4.3		3.9
VI	3.8	3.7		

The actual figures vary widely probably as a result of seasonal conditions or of the temperamental tendency of the subjects. The differences in each series, however, are clearly in favor of the low temperatures.

Results Obtained in Regard to the Effect of Carbon Dioxide and Organic Matter and Other Chemical Constituents of Stagnant Air upon Physical and Mental Condition and Efficiency.

Our second problem related to the effect of the carbon dioxide and organic matter and other chemical substances which accumulate in the air of rooms as a result of human occupancy when there is no active change of air. The investigations of Flügge, Hill, Haldane, Benedict and others have all tended to show that these chemical constituents are without harmful physiological effects, but we desired to check these conclusions and extend them by our own observations.

Studies of this point were made in all our experiments except Series I and VI. In Series I there was ample air supply and in Series VI a stagnant condition throughout.

The general conditions of the experiments on fresh and stagnant air are summarized in Table XI although certain of the psychological tests were not made on all the observation days. In each series we have compared two periods in one of which there was an ample fresh air supply of 45 cubic feet per minute per person while in the other the air of the observation chamber remained stagnant throughout. There was of course some air change when our observers entered and left the chamber but this was minimized by the fact that the chamber was entered through two small vestibules fitted with three tight doors. There was also some leakage through walls and the difference between the final carbon dioxide values reached in different experiments was more or less correlated with outdoor weather conditions, the greatest leakage occurring on cold, dry days. The carbon dioxide at the end of the period was always over 20 parts per 10,000. The high values set down in Table XI for the beginning of the stagnant experiments are due to the fact that the first analysis was sometimes made after the chamber had been occupied for an hour.

Samples for carbon dioxide were obtained from a stream of air aspirated from the room continuously from a point six feet above the floor.

1. *Fundamental Physiological Observations.*—The fundamental physiological observations of body temperature, heart rate, increase in heart rate on standing, blood pressure, Crampton value and respiration showed no relation whatever to the chemical condition of the atmosphere. The results have been analyzed from every standpoint without any effect of stagnant air conditions being manifest and it will only be necessary here to present the final weighted averages for all temperature conditions. These averages as summarized in Table XII show no appreciable difference between fresh air and stagnant air conditions, the excess one way or the other being well within the limits of experimental error.

TABLE XI.

SUMMARY OF CONDITIONS STUDIED IN COMPARING FRESH AND STAGNANT AIR.

Series.	Temperature.	Relative humidity.	No. of Subjects.	Period.	Days.	Carbon dioxide.	
						Beginning.	End.
II........	86°	80%	4	Fresh air	12	5	7
				Stagnant	8	6	32
III........	68°	50%	4	Fresh air	5	6	5
				Stagnant	5	13	40
	86°	80%	4	Fresh air	4	6	5
				Stagnant	5	11	26
IV........	75°	55%	2	Fresh air	5	5	5
				Stagnant	5	15	23
	86°	80%	2	Fresh air	5	6	6
				Stagnant	5	13	26
V.........	68°	55%	4	Fresh air	1	12	11
				Stagnant	1	24	52
	75°	55%	4	Fresh air	1	6	6
				Stagnant	1	12	23
	86°	80%	4	Fresh air	1	12	7
				Stagnant	1	23	35
VII.......	68°	50%	4	Fresh air	5	10	9
				Stagnant	5	7	56
	75°	50%	4	Fresh air	5	5	10
				Stagnant	5	5	66

One possible exception to the above appears at first glance in Figure V illustrating rate of pulse recovery after physical work. In this case the average recovery under air conditions is slightly quicker than under stagnant conditions. However, this quicker return is manifest only on the warmer days, the air supply and stagnant curves at 68° coinciding very closely. This result agrees with the improvement in physical work done on air days only at the warmer temperature, as will be noted below on page 114, and is no doubt to be explained by the cooling effect of the draft of incoming air.

2. *Special Physiological Observations.*—The special physiological studies in Series III, IV and V of dead space in the lungs, acidosis of the blood, respiratory quotient, rate of heat production, rate of digestion, protein metabolism, concentration of the urine and skin sensitivity might naturally have been expected to show a more direct response to excess of carbon dioxide, hypothetical organic poisons and other chemical substances present in breathed air, yet in no single instance was any definite relation manifest.

TABLE XII.

RELATION BETWEEN FRESH AND STAGNANT AIR CONDITIONS AND CERTAIN FUNDAMENTAL PHYSIOLOGICAL CONDITIONS.

Average for All Series.

Observation.	Fresh air condition.	Stagnant air condition.
Body temperature	37.16	37.04
Heart rate	75.0	75.8
Increase in heart rate on standing	22.4	22.1
Blood pressure	115.2	114.1
Crampton value	43	43
Respiration	19.1	19.2

3. *Mental Work.*—Efficiency in mental work was measured under fresh and stagnant air conditions in Series III only. The psychological work done in Series II cannot be used because at the beginning of this series there were defects in the plant which prevented the maintenance of desired temperature conditions without air supply. The stagnant condition was therefore sacrificed for a time and the effect of practice renders the few data later obtained for the stagnant condition incomparable.

In Series III we have at present completed computations only for the grading specimens of handwriting. With an ample supply of fresh air the average error in the gradings was 1.37; with a stagnant air condition it was 1.43, a difference within the limits of the probable error.

In Series V we obtained a measure of the inclination to do mental work when a choice exists. Under each of the three temperature conditions plotted in Figure VII there was a stagnant and a fresh air condition and inspection of the Figure shows that in neither mental multiplication nor typewriting nor heavy reading is there any tendency to accomplish more on fresh air days than on the stagnant days with the same temperature conditions.

4. *Physical Work.*—Series III and Series VII offer good comparisons of the amount of physical work performed with stagnant and fresh air.

In Series III the subjects on the fresh air days performed an average of 36,075 foot pounds of work and on the stagnant days 37,800 foot pounds, an advantage of 4.7 per cent. for the stagnant days. In Series VII the subjects on the fresh air days performed an average of 23,925 foot pounds of work and on the stagnant days 23,400 foot pounds, an advantage of 2.1 per cent. for the fresh air days. These differences are both slight and in opposite directions so that on the whole the chemical condition of the atmosphere seems to have no influence on the performance of physical work.

The accuracy with which all conditions must be controlled in such experiments is well illustrated by a closer examination of the work records in Series VII. The average work done by four subjects under the fresh air conditions was 2 per cent. better than under the stagnant condition. The bulk of this improvement, however, occurred on the warm, air days when 5.6 per cent. more work was done than at 75 degrees without air. On the cold days 0.8 per cent. more work was done under stagnant conditions. Furthermore, on these warm days three subjects who were more or less exposed to the draft of the incoming air made the improvement whereas the fourth subject who at no time was benefited by the moving air did better on the stagnant days. These results suggest that the slight improvement on the fresh air days was due to the cooling effect of the draft.

5. *Appetite.*—So far, all our observations like those of previous observers had tended to the conclusion that the chemical condition of ordinary respired air was without physiological effects. In the studies on appetite, however, we obtained results which may prove significant.

In the experiments of Series III four subjects were observed for a period of six weeks from 8 a. m. to 4 p. m. on five days of the week. For four of these weeks we have a comparison of fresh and stagnant air, two of them at 68° and two at 86°, one week at each temperature having an air supply of 45 cubic feet per minute per capita while the other had no air supply. At noon a luncheon was served to each subject in the observation room. The food served varied widely but the amount of each article furnished and the amount left on the plates was weighed and a calculation made of the number of calories consumed by each subject.

As noted above a comparison of the 68° and 86° condition, ignoring air conditions, showed a slightly greater appetite in the cool room but grouping the temperatures and comparing the air conditions leads to even more striking results. On the stagnant days each man consumed an average of 1,151 calories and on the fresh air days an average of 1,308 calories, an increase of 13 per cent.

In Series VII four subjects were observed for four weeks, for two weeks with ample fresh air supply and for two weeks under stagnant conditions, each air condition having one week at 68° and one at 75°. The procedure was the same as in Series III, the lunches including such substances as roast beef, tongue, cream cheese, datenut butter and egg and lettuce salad. The menus varied from day to day but each was repeated an equal number of times under all the different conditions.

The subjects under the stagnant air conditions consumed an average of 1,492 calories per day and under the fresh air conditions an average of 1,620 calories, an increase of 8.6 per cent. under the fresh air conditions (See Fig. IX).

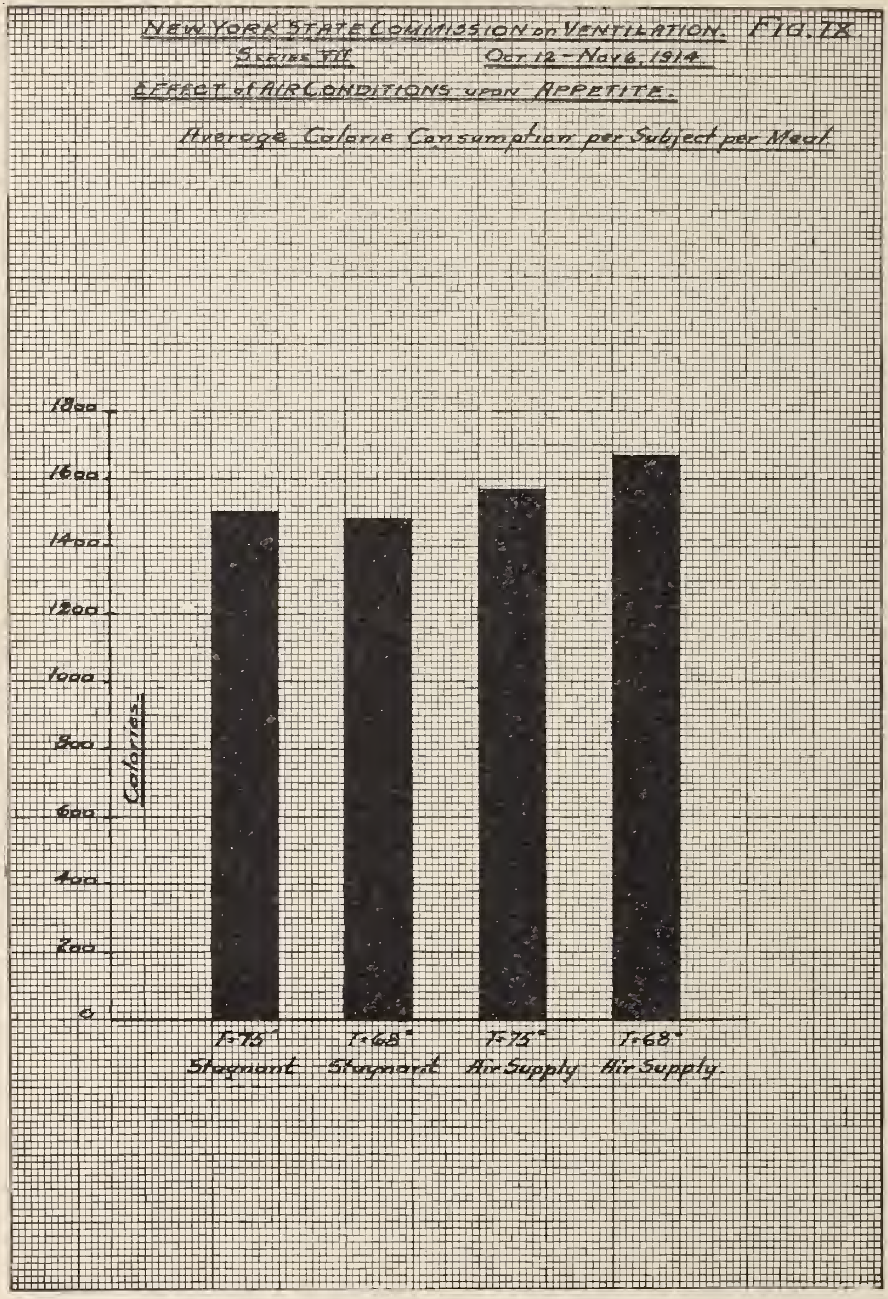

NEW YORK STATE COMMISSION on VENTILATION.
FIG. IX
SERIES VII
OCT 12 - NOV 6, 1914.
EFFECT of AIR CONDITIONS upon APPETITE.
Average Calorie Consumption per Subject per Meal
1800
1600
1400
1200
1000
800
600
400
200
0
Calories.
T=75° Stagnant
T=68° Stagnant
T=75° Air Supply
T=68° Air Supply.

Fig. IX.

These experiments are being repeated and the first series completed since the report was presented at Jacksonville has yielded practically negative results.

6. *Opinions as to Comfort.*—The opinions of the subjects as to their feeling of comfort in the observation room were recorded in Series II and Series V under comparable temperature conditions but with either ample air supply or stagnant air. In Series II the average vote of four subjects a day on 12 days with a fresh air supply of 45 cubic feet per minute per capita was 3.5; the average vote of four subjects a day for 8 days when the air was stagnant was 3.8 (for scale of judgment see page 111). In Series V four subjects on 3 fresh air days gave an average comfort vote of 4.2 and on 3 stagnant days an average of 4.4. In each case there was a slight preference for the stagnant days. It may be noted as of interest that the carbon dioxide at the end of the stagnant days averaged 32 parts per 10,000 in Series II and 36 parts in Series V.

SUMMARY AND CONCLUSIONS.

The work of the Commission is of course going on and no final opinions have been reached upon any points.

The following tentative conclusions seem however, to be indicated by the experiments of the first year as outlined above.

1. A very high room temperature such as 86° F. with 80 per cent. relative humidity, produces slight, but distinct elevation of body temperature, an increase in reclining heart rate, an increase in the excess of standing over reclining heart rate, a very slight lowering of systolic blood pressure, and a marked fall in the Crampton value.

2. A moderately high room temperature, 75° with 50 per cent. relative humidity, has all the effects noted above although of course in less degree than the extreme temperature condition.

3. Even the extreme room temperature of 86° with 80 per cent. relative humidity shows no effect upon rate of respiration, dead space in the lungs, acidosis of the blood, dissociation of oxyhæmoglobin, respiratory quotient, rate of heat production, rate of digestion, carbohydrate or protein metabolism, concentration of the urine and skin sensitivity.

4. The power to do either mental or physical work, measured by the quantity and quality of the product by subjects doing their utmost, is not at all diminished by a room temperature of 86° with 80 per cent. relative humidity.

5. On the other hand the inclination to do physical work, and the inclination to do mental work are diminished by sufficiently high room temperatures. So far as physical work is concerned our tests show a decrease in actual work performed, when the subject had a choice between

working or not working, of 15 per cent. under the 75° condition and of 37 per cent. under the 86° condition, as compared in each case with 68°.

6. Stagnant air at the same temperature as fresh air, even when it contains 20 or more parts of carbon dioxide and all the organic and other substances in the breathed air of occupied rooms, has, so far, shown no effect on any of the physiological responses listed above under 1 and 3 nor on the power or inclination to do physical or mental work nor on the sensations of comfort of the subjects breathing it.

7. On the other hand the appetite for food of subjects exposed to such stagnant air may be slightly reduced.

8. These experiments seem to indicate that overheated rooms are not only uncomfortable but produce well-marked effects upon the heat regulating and circulatory systems of the body and materially reduce the inclination of occupants to do physical work. The most important effects of "bad air" are due to its high temperature, and the effects of even a slightly elevated room temperature such as 75° are sufficiently clear and important to warrant careful precautions against over-heating.

9. The chemical changes in the breathed air of occupied rooms are of comparatively minor importance although the substances present in such air may exert a slight decrease in the appetite for food.

SANITATION OF THE CITY OF VERA CRUZ, MEXICO, AND ARMY CAMPS DURING OCCUPATION OF UNITED STATES EXPEDITIONARY FORCES.

JAMES T. B. BOWLES,
Sanitary Expert, United States Expeditionary Forces, Vera Cruz, Mexico.

The general plan of sanitation instituted here was that which had been so successfully worked out in Panama by Surgeon General Gorgas.

General Gorgas has his methods of sanitation so well defined, that all that is necessary for him to do is to call his trained force together and proceed with the work without any more doubt as to its results than any other expert, who has well-planned and logical methods with which to solve his problems. It is for this reason that the world now looks to General Gorgas to free it from all pests.

The Army Medical Corps has accomplished most wonderful results in tropical sanitation. We have, as illustration, the work done in the Philippines, Porto Rico, Cuba, Panama and now Vera Cruz.

The work at Vera Cruz has its importance in the fact that it was most necessary to protect our troops from disease in order that they might be in the best of condition ready to advance at any time. The very low sick rate and practically no death-rate from disease are proofs of the success of the sanitary work done at Vera Cruz.

The responsibility for Public Health and Sanitation of the city of Vera Cruz passed from Mexican to American authority when the port was occupied by the Navy on April 21, 1914.

On April 30, the sailors were withdrawn and the duties then fell to the Army.

During the interim before the Army took charge, much excellent work was done by the United States Public Health Officers, Surgeons G. M. Guiteras and von Ezdorf who were in charge of the Maritime Service at this port.

Colonel H. P. Birmingham was selected as the man to be in charge of all medical and sanitary work and was thus appointed Chief Sanitary Officer of Civil Affairs and Chief Surgeon of the United States Expeditionary Forces.

The sanitary work was divided into three main divisions, Civil, Military and Maritime.

The Civil Division covered the work of the City Health Department with the following staff:

Major T. C. Lyster, Medical Corps, Director;

Major R. E. Noble, Medical Corps, Assistant Director;

Major E. E. Persons, Medical Corps, Assistant Director;

Captain Julian M. Cabell, Medical Corps, Director of Hospitals;

Lieutenant A. J. Hoskins, Medical Reserve Corps, Assistant Director of Hospitals;

William D. Wrightson, Sanitary Engineer;

James T. B. Bowles, Sanitary Expert;

E. W. Mitchel, Sanitary Expert.

The city of Vera Cruz was one of the first places in Mexico to be settled by the Spanish invaders and today it is an odd blend of the antique and modern. However, it is still replete with artistic interest and almost every one of its walls carries its story of war and struggles with the fighting buccaneers of the Spanish Main.

Vera Cruz is shaped like a crescent with the sea facing the inner circle while the gigantic sand dunes are to the rear. These sand dunes are quite celebrated, the largest of which covers quite an extensive area and is about 150 feet high.

Office of the Department of Public Health. Vera Cruz.

There is a population of about 54,000 people, part Indian, Mexican and some Spanish.

A very good sanitary code was found which gave the authorities ample power for imposing penalties if the laws were not properly carried out. The unfortunate part was that the Mexican authorities did not exercise their power in regard to the sanitary laws.

Upon arrival of the American troops the city presented a very dirty and neglected appearance with flies swarming everywhere.

Most of the work done by the Mexican Sanitary Department had been confined to mosquito work, even this was not performed with much enthusiasm.

The central part of the city is well paved with hard asphalt while the greater part of the residence portion is paved with cobblestones. There is also a fairly good sewer system as far as it extends. The sanitary sewage runs into a sump from which it is pumped along the breakwater into the sea. The storm water flows by gravity direct into the sea.

WATER SUPPLY.

There are two water supply systems for Vera Cruz. The main supply coming from the Jamapa River and is filtered at Tejar and is used everywhere. The other supply comes from the swampy region at Legarto and supplies the Terminal Company exclusively for railroad work and washing purposes.

Slow Sand Filter—Vera Cruz Water Supply.

The waterworks plant at Tejar was installed by Pearson & Company, Ltd., in 1904.

The water flows by gravity from the Jamapa River into a receiving well, from which it is pumped into a small reservoir and from there it flows by gravity into a sedimentation basin, having about four hours of rest. After passing through the sedimentation basin the settled water flows by gravity onto four slow sand filter beds, the filtered water flowing into a receiving well and then into a sump.

The water is pumped from a sump through a 15-inch and a 10-inch main into the distributing reservoir at Los Cocos. From this distributing reservoir, the water flows by gravity through a 20-inch main to Vera Cruz.

The water plant has a capacity of 2,000,000 gallons per day which is not sufficient for Vera Cruz and of course less sufficient now with the additional population caused by occupation of the city by the United States Expeditionary Forces.

In order to economize on the use of water, the supply is turned off from a part of the city for certain periods of the day and night, thus allowing the head to increase in the distributing reservoir at Los Cocos.

The inhabitants protect themselves during the time that the water is shut off by providing tanks on the roofs of their houses. These tanks are connected with the main supply by a float valve so that when the tank is full the city pressure is shut off.

An apparatus for putting chlorine in the filtered water was installed and ready to be used if the water became bad. But it was not necessary to use the chlorine in the water as very good results were obtained from the filters. Both chemical and bacteriological control analyses of the water were made in the Field Hospital Laboratory.

The analysis of raw water showed gas in 1 cc., $\frac{1}{2}$ cc., 1/10 cc., lactose broth and four or five thousand bacteria per cc. on agar plates.

The filtered water showed no gas in 1 cc., $\frac{1}{2}$ cc., 1/10 cc. lactose broth and generally less than fifty bacteria per cc. on agar plates.

In order to increase the water supply, surveys were made and it was found that the present supply could be increased at least 45 per cent. by installing a booster pump to raise the water into Los Cocos reservoir, thereby relieving the pressure on the line and allowing both pumps at Tejar to be used. This scheme was recommended and accepted, with the idea that the pump would be purchased as soon as the city had the money.

DISPOSAL OF GARBAGE.

The disposal of garbage as well as sewage, maintenance of streets, water supplies and care of city markets comes under the Department of Public Works of which Major Paul A. Wolf is Director.

The Mexicans formerly disposed of their garbage by selling it to a man to run a piggery. The city received 1,000 pesos a year for the garbage, and the citizens were required to pay for the hauling of it out to the piggery. The result was that there were no proper receptacles for holding the garbage and it stood around breeding flies for a long time before it was hauled away.

When the United States Forces came into the city a garbage dump was started and a good road made to the dump. Garbage cans with lids were provided in sufficient numbers and sold at a nominal price to the citizens. The city hauled all the garbage, rubbish and manure out to the dump, where it was thoroughly burned. The ashes from the burning material served to fill a swampy region which was breeding mosquitoes. The dump was kept in an excellent condition and all material burned as fast as it was hauled out so that there was no chance for fly breeding.

ANTI-YELLOW FEVER WORK.

There has been no case of yellow fever in Vera Cruz since 1909 but it was known that unless preventive measures were taken it would be possible to have it again as so many non-immunes would be passing through the port. Thus the work of destroying all stegomyia mosquitoes and their breeding places was carried on with vigilance.

The city was divided into two main sections, urban and suburban, with a chief inspector at head of each section. These sections were divided into small divisions with an inspector in charge of each division and held responsible for the sanitary condition of it. Reinspections were made to see if the work was being carried on properly.

All parts of the city, houses, patios, etc., were carefully inspected for water containers breeding mosquitoes. The stegomyia is known as a house mosquito and this was kept in mind while carrying on the work.

It is still the custom to have containers for water surrounding plants to prevent ants from destroying vegetation. These places were a great source of breeding for the yellow fever mosquito. In finding these containers they were emptied and oiled.

Poultry of all kinds were kept in patios, but this has been prohibited. Whenever water containers were found breeding mosquitoes, the owners were warned about it and if found again were fined in court.

In this manner the breeding of stegomyia mosquitoes was reduced to a minimum.

ANTI-MALARIAL WORK.

Certain parts of Vera Cruz have been called by the native inhabitants "fever districts" around what is known as "Laguna" and "Los Cocos" districts. This part is very low and swampy and for that reason difficult to drain, forming great areas for breeding mosquitoes.

The rainy season extends from the last of April to November; however, most of the rain falls during June, July, August and September. Taking the average for the last five years, gives us about 50.0 inches. The amount of rainfall for the last five years is given in the accompanying table.

It has been difficult to obtain accurate statistics in regard to death-rates, as diagnoses were often put down as malaria when they were probably something else. According to Mexican records the death-rate from malaria has always been high in June and the curve has progressively risen during the four succeeding months. This would coincide with the rainy season. The death-rate for June, 1914, is much the lowest rate recorded for the last five years. See accompanying table of death-rate for all diseases during the last five years, arranged in months and years.

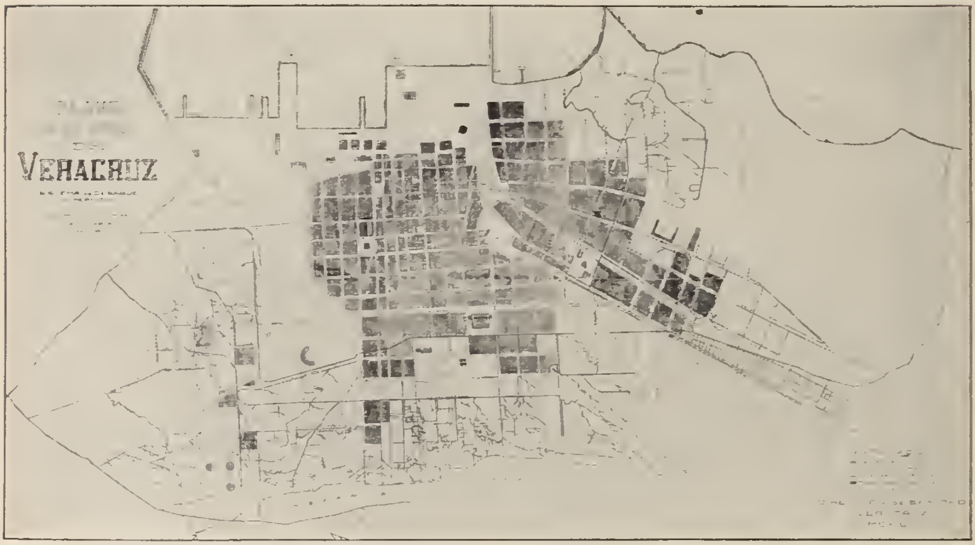
One of the most important parts of anti-malarial work is drainage.

There were a number of open drains found on our arrival which had been used for irrigation purposes. These ditches were graded and put into use for our work.

The drainage system that was established consists of about fifty-five miles of open drains, trunk lines, laterals and further division of laterals, all eventually emptying into the sea. These ditches extend both within and without the limits of Vera Cruz and also areas beyond our lines whereby mosquito development has been greatly reduced and kept so in spite of the rainy season.

After the ditches were constructed the sides were kept oiled and all grass removed from the bottom in order that the flow of water would not be stopped.

As the city is very low, there are many places near the outskirts that are very difficult to drain. Wherever pools of water were found they were oiled continuously or were sprinkled with larvacide until pools had dried.



System of Drainage Ditches put in by United States Expeditionary Forces.

The larvacide used was similar to that made in Panama.

A map of city showing the ditching system accompanies this article.

Some interesting data was obtained by Mr. Mitchel in regard to anopheles breeding. A tent was pitched in the neighborhood of Los Cocos as this particular place had had the most malaria. The result of the experiment showed that the anopheles were coming from a swamp beyond our outposts. This is a very large area and the expense to drain it would be prohibitive. The approach of the dry season has lessened the influx of anopheles and also aided by a greater amount of grass cutting.

The species of anopheles found was entirely albamanus.

The anti-malarial work was very much aided by the Field Hospital Laboratory which was in charge of Major F. F. Russell. Without the assistance of the laboratory, it would have been impossible to have attained such excellent results in the work.

In order to localize the infection among the natives, the city hospitals and local physicians were requested to send in samples of blood from all patients.

According to laboratory diagnosis the following positive malarial parasites were found in civilians:

June, 1; July, 6; August, 64; September, 24.

Malaria has been a reportable disease by the Health Department and all houses where proven cases of malaria have occurred, have been visited by inspectors and secondary cases are unknown.

Malarial cases among the Army according to laboratory diagnosis were as follows.

May, 3; June, 17; July, 30; August, 48; September 7.

The effect of the anti-malarial work is beginning to show in September.

Anti-Typhoid and Anti-Dysentery Work.

The methods used in preventing one of these diseases will do for both and for that reason they are considered under one head.

Drainage Ditch for Anti-Malarial Work.

There has been only one case of typhoid fever and that was a civilian who did not live in the city.

When the troops first arrived in Vera Cruz there was a large number of cases of dysentery among the soldiers. During May there were sixteen cases in the Army and thirty among the Marines, two of which were amœbic while the others were bacillary dysentery. During June there were six cases of bacillary dysentery. August eight cases of bacillary and two of old amœbic infections from the Philippines. September only two cases and they were bacillary.

Dysentery is the principal disease to fight in the Army.

The great reduction and control of dysentery shows the results of the efficiency of the general sanitary measures instituted to prevent it. The anti-fly campaign is probably the most important. This was brought about by the proper collection and burning of all garbage, street cleanings and manure; screening of all food stuffs, city meat and fish markets; also the disinfection and isolation of all dysentery cases; fly traps placed around where food was sold.

INSPECTION OF CITY MILK SUPPLY, WATER SUPPLIES, FOOD SUPPLY AND BEVERAGES OF ALL KINDS.

Samples of city milk were obtained from the "lecheros" that sold the milk from house to house. About 350 samples of milk were analyzed and at least 100 samples were found bad and condemned. The "lechero" was fined and prohibited from selling milk until his milk came up to the standard. All milk was boiled before it was used.

Vera Cruz "Milk Wagons,"

All food supplies such as coffee, lard, butter, meats, sandwiches, candy, bread, etc., were inspected and if found in bad condition, the merchants selling them were fined.

Analyses of city water were made continuously to keep control of the filters.

The native drinks, both alcoholic and non-alcoholic were inspected and the alcoholic drinks were generally found bad, such as pulque, tequila, etc. These drinks had bad effect on the soldiers and sailors so were suppressed whenever possible.

ANTI-SMALLPOX WORK.

Smallpox was found epidemic when our forces entered Vera Cruz. It was seen at once that drastic measures must be taken at once to prevent the spread of the disease. By June the spread of this disease had reached alarming proportions.

The city was divided into districts and a house to house vaccination was started May 18. Up to the present time 53,000 people have been vaccinated. The vaccinations were made by the Mexican physicians under the supervision of the Health Department and on reinspection have been found to have been honestly and efficiently performed.

Besides the vaccinators going from house to house, there were others who vaccinated on the train catching all the people that came in from the interior.

Whenever cases of smallpox were found they were removed to the Lazaretto. The total number of cases since our arrival here is 42 with 12 deaths. There was no smallpox among any of our forces. There are no cases at present at Lazaretto.

PREVENTION OF TUBERCULOSIS.

Tuberculosis of all kinds rank very high in Vera Cruz. There were 154 deaths for the month of June, 19 of which were from tuberculosis. According to the statistics here, this is the lowest rate for June during the last five years. It is known, however, that tuberculosis is on the increase here.

Inspections were made over the city and all serious cases that were found were sent to one of the city hospitals for treatment and care.

Leaflets explaining how people suffering with tuberculosis should take care of themselves to prevent it from spreading, were printed by the Department of Health and posted in all patios, cantinas, and public buildings.

There was very little money in the Public Health Department to carry on the general work and practically none could be spared for any extensive anti-tuberculosis work. However, everything was done that could be done under the circumstances.

PREVENTION OF PLAGUE.

No case of plague developed or was brought to the port during our occupation.

Vessels arriving from plague-infected ports were thoroughly inspected and fumigated.

No extensive anti-plague work was carried on with exception of general repairing of houses having old wooden floors and the cleaning up of all trash and rubbish from old buildings and patios that might harbor rats.

If our troops had stayed here the general methods for plague prevention were to be instituted, such as catching of rats and examining them, rat proofing of buildings, etc.

CIVIL HOSPITALS.

There are three city hospitals and one private hospital, Beneficencia Espanola.

San Sebastian was opened in 1854 for all poor men of the city without contagious diseases as there is no isolation ward.

Zamora was opened in 1874 as a home for orphan boys and girls and also old women who have no home.

Loreto was opened in 1860 as a woman's hospital. It is almost entirely used as a place for treatment of "Public Women."

In the Mexican Sanitary Code, there is a law in regard to the regulation of public women. All houses and women are licensed and are divided into three classes.

Field Hospital No. 3.

As this law was enforced by the Mexican authorities it was thought best to carry out the same plan.

An examination is made of each class once per week at Loreto Hospital. Each woman has a book which she obtains from the Police Department. This book contains her name, date of license and the status of her condition. The physician at the hospital examines her and makes a note in her book in regard to her condition after each examination. If her condition is suspicious she is retained in the hospital for treatment.

There are about 300 licensed prostitutes and 1,200 unlicensed.

It is estimated that 2 per cent. of the first class are diseased and 4 per cent. of the second and third classes are diseased.

Clandestines are brought in whenever found and about 90 per cent. are diseased. The ages of clandestines run from 12 to 35 years. Of the licensed public women, most of them are Mexicans, while the better and cleaner ones are French, being less than 1 per cent. diseased.

All of the hospitals were found in a deplorable condition. They have now been cleaned and repaired. Mexican physicians and other employees were retained, but under the supervision of a Director of Hospitals, who is a Medical Officer.

Patients are well fed and cared for as well as the Mexican system of nursing permits. It was the plan to use Mexican female trained nurses, should our stay in Vera Cruz be prolonged.

GENERAL SANITARY WORK.

The inspectors of the different divisions and districts made house to house inspections in regard to everything that related to sanitation, such as possible cases of contagious and infectious diseases, general condition of houses, shops, cantinas with special inspections of closets, bathrooms and repairs of buildings that were necessary for proper sanitation. If it is a shop where food products are sold, the condition of food is examined and if it looks suspicious, the food is sent to the laboratory for proper examination.

All water containers are examined and notes made in regard to mosquito breeding places.

If conditions are bad and repairs are found necessary, written orders are given for the work to be done in such a time and if it is not done by the stated time and no good reason given, the people are brought up in court and fined.

Thus one can see, that the Provost Marshal Court has been a great assistance to the Department of Public Health in enforcing sanitary regulations.

MILITARY DIVISION OF SANITATION.

Under the division of Military Sanitation, Major F. M. Hartsock was appointed Sanitary Inspector of United States Expeditionary Forces, Major A. W. Williams, in charge of Field Hospital and Major F. F. Russell, in charge of Field Laboratory.

The following sanitary regulations for the troops were issued on the recommendation of Chief Surgeon H. P. Birmingham, Colonel Medical Corps, by Commanding General Funston:

1. *Disposal of Garbage.*—For detachments or companies in camps or in isolated locations where other means are not available, the incinerator will be used. Where disposal may be readily made by means of the city carts, the garbage can may be used. The cans will be thoroughly cleansed, scalded and coated with crude petroleum after emptying. Liquid waste may be poured into city sewer openings where available; in such cases, however, a cover will be provided for the same and the surroundings kept free from grease, etc. Tin cans will be incinerated, afterwards smashed and dis-

posed of as dry garbage. Ashes, dry garbage, etc., will be hauled to and deposited on city dump.

2. *Disposal of Manure and Care of Picket Lines.*—All manure will be hauled to city dump. Picket lines will be kept broom swept and all manure and straw hauled off daily. A weekly incineration of picket lines will be accomplished with crude oil at the rate of ten gallons to each line.

3. *Disposal of Excreta.*—Where a water carriage system is not feasible, the Havard box will be used over earth latrines. Daily inspection of this system is enjoined on part of the Medical Officer of the organization who will see that the following system is carried out.

The latrines will be burned out thoroughly with crude oil and hay twice daily (each burning one gallon of oil and 7½ pounds of hay). The boxes at all times to be kept fly tight—this implies closure of all cracks and care of the hinges and a back construction so that the lids drop automatically. The latrines seats will be washed off twice weekly with a 1/100 per cent. solution of creoline and whitewashed inside twice weekly. Latrines will be rebuilt when filled to within two feet of top. Where water carriage system is in vogue, either the automatic flush or trough will be installed.

4. *Kitchens.*—Kitchens and mess rooms will be securely screened and an efficient fly trap will be provided for catching such flies as gain entrance thereto. Ice boxes installed will be inspected daily and drip pans emptied and scalded out. Garbage cans will be kept on wooden racks elevated from the ground and cans burned out daily with oil to prevent fouling, and kept clean outside with a coat of whitewash.

5. *Shower Baths.*—Arrangements will be made for the installation of shower baths for all troops and a careful inspection will be made daily to see that waste water therefrom is so disposed of as to prevent mosquito breeding.

6. *Water Supply.*—The city water supply is considered potable. The Terminal water supply is at present unfit for human consumption.

7. *Mosquito Bars.*—The use of mosquito bar is imperative and it will be used by all in districts where mosquitoes are prevalent.

8. *Foods.*—Attention is called to use of following foods, the elimination of which from messes will serve to prevent a variety of intestinal disorders: (a) Hashes of meat and potatoes prepared the night previous (ptomaine poisoning of severe type); (b) Canned milk and fish opened the day before (milk and fish poisoning); (c) Locally grown green vegetables uncooked (dysenteries and diarrheas).

9. *Quinine Prophylaxis.*—The daily use of three grains of sulphate of quinine as a malarial prophylactic is made compulsory for all troops. This dose has been increased to six grains for troops living near the most infected malarial districts.

10. *Daily Inspection of Commands.*—Surgeons of organizations will make daily inspections of the commands to which they pertain, covering the following: Picket lines, latrines, kitchens, barracks, inclosed toilets, baths, garbage receptacles, incinerators and all food supplies; they will make a verbal report at once to their respective commanding officers for the correction of any sanitary defects noted, and a similar report, with the action taken to the Sanitary Inspector on his next visit.

11. *Special Report.*—A special report will be made at once by the surgeon of each organization to the Sanitary Inspector for the information of the Chief Surgeon, in the following cases: (a) Acute infections, or contagious disease developing in barracks or camps; (b) Cases of fever of 101° or over attended with albuminuria; (c) Unusual prevalence of mosquitoes in vicinity; (d) Development of amœbic dysentery or malaria in the command.

12. *Venereal Prophylaxis.*—Venereal prophylaxis and venereal inspection will be thoroughly carried out and the required monthly report of number of new cases of venereal disease will be sent to the Chief Surgeon, through the Sanitary Inspector each month.

13. *Mosquito Breeding Areas.*—Areas about barracks in which mosquitoes could breed, such as cisterns, tanks, gutters, pools and drains will be kept under close observation by the surgeon, and the proper remedies applied as screening, draining, oiling, etc.

Division of Maritime Sanitary Service.

When the United States Expeditionary Forces came to Vera Cruz, the maritime service was pretty well equipped with a good building on Sanidad pier. The building contained boilers for a disinfecting outfit, showers and plenty of room for baggage and passengers.

The Quarantine Service is now in charge of Dr. I. A. Campbell of the United States Public Health Service. Excellent work has been done by this Department.

As a result of the sanitary work we have to show a sick rate of less than the average for troops in the states, and a death-rate practically *nil.*

The sanitary work carried on at Vera Cruz, was almost entirely for the benefit of the United States Forces.

The money expended by the Health Department came from the following sources: 10,300 pesos from Municipal Funds, 2,175 pesos from State Funds, and 2,175 pesos from Federal Funds, making a total of 14,650 pesos per month. Out of this sum must be paid the amount necessary for maintenance of city hospitals.

It was seen that this fund would not be near enough to take care of the health of the city and the health of the troops. For that reason General Gorgas asked for an appropriation from the United States War Depart-

COMPARATIVE STATEMENT OF DEATHS FROM THE MORE IMPORTANT COMMUNICABLE DISEASES DURING THE PAST FIVE YEARS.

Disease.	Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Typhoid Fever . . .	1910	....	....	....	....	....	....	....	....	....	....	....	....	....
	1911	....	....	....	....	....	....	....	....	....	....	....	....	....
	1912	....	....	....	....	....	1	2	2	....	2	....	....	7
	1913	....	....	....	....	1	....	....	1	....	1	1	....	4
	1914	....	....	1	....	....	1	....	....	....	....	....	....	2
Malaria	1910	8	6	11	13	17	17	27	48	29	42	32	16	266
	1911	20	10	12	19	18	25	34	40	25	40	25	25	293
	1912	14	14	13	7	16	14	15	31	24	17	18	16	199
	1913	16	8	6	5	10	11	19	14	16	22	19	16	162
	1914	10	6	7	7	12	8	2	2	2	....	....	....	54
Smallpox	1910	....	....	....	....	....	....	....	....	....	....	....	....	....
	1911	....	....	1	....	....	....	....	....	....	....	....	....	1
	1912	....	....	....	....	....	....	....	....	....	....	....	....	....
	1913	....	1	....	3	5	4	1	....	....	....	4	1	19
	1914	2	2	22	10	5	4	1	0	....	....	....	....	46
Dysentery	1910	2	4	1	....	....	3	3	2	5	1	....	....	21
	1911	2	1	1	2	1	1	3	7	3	3	6	3	33
	1912	1	....	1	1	4	2	1	1	1	1	2	3	18
	1913	....	2	1	3	6	1	2	2	5	....	....	1	23
	1914	2	1	1	2	6	12	4	....	....	....	....	....	28
Tuberculosis	1910	29	35	34	37	22	25	43	22	34	33	25	35	374
	1911	24	37	43	28	26	29	50	49	41	34	31	18	410
	1912	34	40	33	28	32	25	19	24	20	24	25	25	329
	1913	28	28	40	27	32	31	22	30	13	24	30	29	334
	1914	28	24	28	22	47	19	28	13	29	....	....	....	209
Pneumonia	1910	8	10	11	5	7	6	5	5	7	9	4	6	83
	1911	12	9	10	3	3	6	5	5	2	4	9	18	86
	1912	9	12	4	6	11	5	5	4	5	7	9	5	82
	1913	4	8	2	5	13	5	5	8	7	2	4	5	68
	1914	9	7	11	2	8	9	1	4	9	....	....	....	51
Diarrhea Enteritis under 2 years	1910	3	3	3	7	2	5	23	10	5	5	13	15	94
	1911	12	10	5	2	2	3	4	9	3	6	7	9	72
	1912	13	2	5	8	9	25	34	12	12	12	10	10	152
	1913	5	7	9	12	12	9	12	5	6	5	5	16	103
	1914	11	3	4	11	29	19	14	4	8	....	....	....	95
Diarrhea Enteritis 2 years and over	1910	6	2	7	11	7	15	13	10	10	7	18	16	122
	1911	17	8	8	8	9	17	12	10	8	22	16	24	159
	1912	13	18	9	18	12	15	29	12	18	20	32	25	221
	1913	16	11	15	8	7	6	12	17	9	9	15	12	137
	1914	19	8	13	10	14	28	23	18	20	....	....	....	133

RAINFALL REPORT 1910, 1911, 1912, 1913, 1914.

Year.	No. of rainy days.	Amount rain in inches.	Amount of rainfall per month in inches.								
			April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910	79	49.94	0.23	1.4	10.01	9.05	4.14	14.9	7.01	0.58	2.55
1911	108	57.17	1.86	3.24	11.42	8.26	8.17	14.94	6.29	2.72	0.26
1912	64	26.99	0.00	0.37	3.71	8.58	5.56	6.54	1.65	0.58	0.00
1913	97	65.65	0.23	1.01	14.22	17.90	4.65	13.65	7.62	5.18	1.19
1914			no data	no data	2.48	3.17	1.58	8.0			

ment to be used for municipal sanitation wherever the health of the troops was concerned. Ten thousand dollars in gold was granted for this work and since then other amounts have been added, making a total of $26,000 gold expended out of United States funds for municipal sanitation. Most all of this money was expended for anti-mosquito work, with the exception of about $2,000 gold that was expended on screening the city markets and building of garbage dump road.

The advancement of preventative medicine is wonderful and sanitarians are fast gaining the confidence of the general public.

It is now known that sanitation today is not a haphazard collection of questionable theories but is based upon well-proven theories or facts. The work has passed the experimental stage and our methods of sanitation are just as accurate as those for solving an arithmetical problem.

But in order to be successful, money and authority to act must be had or else the work will be handicapped and possibly result in failure.

It is to be hoped that the excellent results of the work of the United States Army Medical Corps in the tropics, will show to the United States Government and its people at large what could be done in cleaning up some of our own American cities if the money and authority were granted for the work.

I wish to express my thanks to Surgeon General W. C. Gorgas for his permission to publish this article and to Col. H. P. Birmingham, Chief Surgeon of the United States Expeditionary Forces and Major E. E. Persons, Director of Public Health, Vera Cruz, for their kind assistance.

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NEW STUDIES IN VENTILATION.

The first year's work of the New York State Commission on Ventilation, the results of which appear on another page, is a notable contribution to the science of the subject. Realizing that present-day dissensions cannot lead to progress and that the newer theories of the relation between man and his atmospheric environment are viewed askance it seemed desirable to reëxamine the basic facts and conduct new experiments with the greatest thoroughness and precision. Too much cannot be said in praise of the spirit with which this study has been undertaken.

Some one unfamiliar with recent developments may ask "What is the discussion all about? What more is there to the question than that we want fresh air?" In a word the newer theories conceive the problem, as Professor Lee says, as physical rather than chemical, cutaneous rather than respiratory. According to the modern view it is the temperature of the atmospheric envelope, not its chemical character, that has the greatest effect on human physiology.

The commission has undertaken to study by means of very careful physiological, psychological, and physical measurements on human subjects living in a room of controlled atmosphere, these four elements of the problem: First, the effect of heat and humidity; second, the effect of chemical effluvia from human occupancy; third, drafts; fourth, excessive dryness.

The study of the body temperature is relatively modern. The older physicians can recall the time when the clinical thermometer was unknown. Then came the days when normal body temperature "was regarded as a constant." Now we know that the temperature of all parts of the body is not the same, that the temperature fluctuates and is influenced by atmospheric environment and that the bodily adjustments to outside influences, marvelous as they are, are not as rapid as we once thought. The present studies support this idea. It was found by the ventilation commission that as the air temperature rose the body temperature of the subjects rose and their blood pressure decreased, but no effect was found on the rate of respiration, on the general processes of metabolism or on the power to do physical or mental work. Higher temperatures, however, retarded the inclination to work. Stagnant air, as compared with similar air in motion, had no other physiological effect than to decrease the appetite for food. Apparently this was the only bit of scientific evidence produced in favor of fresh air as compared with stagnant air of the same temperature and humidity.

This last result was doubtless an unexpected one and shows the importance in such studies of making complete observations. The experimental work is far from completed and in the last analysis it is quite likely that some factor regarded heretofore as unimportant will loom large. It will not do to shift our ideas in this matter too rapidly for among other things the element of dirt and what might be called colloidal dust has not been thoroughly considered. It must be admitted, however, that the New York experiments are in line with the latest English researches in showing the great importance of the temperature of our atmospheric environment and its effect on the thermal relations of the body.

OBSERVATIONS ON THE WIDAL REACTION FOLLOWING THE ADMINISTRATION OF TYPHOID VACCINE.*

E. M. Wade, M. A., and O. McDaniel, M. D.,
Division of Preventable Diseases, Minnesota State Board of Health.

Read before the Laboratory Section, American Public Health Association, Jacksonville, Fla., December 3, 1914.

In January, 1913, the Laboratory of the Minnesota State Board of Health was authorized to manufacture and distribute free of charge typhoid vaccine. Immediately one of the largest state institutions (A) a hospital for the insane which had desired for some time to immunize all of its inmates, requested the necessary vaccine. This seemed a splendid opportunity to make some studies on the Widal reaction as a large percentage of the population is resident over considerable periods of time. Also, in this institution, typhoid fever had been endemic for many years.

The laboratory was ready to commence this piece of work and to furnish the vaccine in February, 1913, and found ready and willing coöperation from the staff of the hospital.

The vaccine used was prepared after the directions of Dr. F. F. Russell, U. S. Army Medical Corps, and was used on the first patients at seven-day intervals. This was later changed to ten-day intervals. Specimens of blood were collected from each patient before inoculation, at the time of each dose and following the third injection. When this had progressed for a short time it was decided to examine specimens of blood after varying lapses of time to determine the length of time the agglutinins remain in the blood of immunized persons.

Because of the magnitude of the work, the institution having a resident population of about 2,000 persons, but one dilution of the blood could be attempted. The routine dilution used was 1:50 and the microscopic agglutination test performed.

A year later a second institution (B) a school for feeble-minded and epileptics with a resident population nearly as great decided upon vaccination of its inmates following a series of typhoid fever cases. The same methods were employed except that the institution staff was not willing to collect so many blood specimens so that in this institution specimens were taken only before inoculation and following the third injection.

In this study all cases showing the presence of the Widal reaction before inoculation are omitted since they are reported elsewhere.

In institution A, typhoid fever had been so prevalent that one of the physicians in the city in which the institution is located boasted that he had not been without one or more cases of typhoid fever amongst the employees for many years. Not having all the assistance that might be desired, the vaccinating had to proceed slowly. All inoculations were made with platinum-iridium needles which are easily sterilized in a flame. Groups of about 200 persons were immunized and when these had completed their three injections another group of 200 was taken. In this way a very good control was constantly present as there were at all times both vaccinated and non-vaccinated persons living under identical conditions. The last persons were inoculated in September so that the whole procedure covered approximately eight months.

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*This work was commenced by the Laboratory Division before the reorganization of the Divisions of the State Board of Health.

When the vaccination had well progressed, its good results were so evident that the employees petitioned the hospital authorities to administer the vaccine to them. This petition was granted.

TABLE I.

AN ANALYSIS OF 1094 CASES SHOWING THE TIME OF PRIMARY APPEARANCE OF THE WIDAL REACTION (1913).

	At time of 2nd dose.	Time of 3rd dose.	10 Days after 3rd dose.	2 Weeks after 3rd dose.	3 Weeks after 3rd dose.	4 Weeks after 3rd dose.	Later.	Total.
Preceded by negative reaction....	381	352	131	11	12	0	1	888
Preceded by partial reaction........		89	24	36	25	19	13	206
Total........	381 34.8%	441 40.3%	155 14.2%	47 4.3%	37 3.4%	19 1.7%	14 1.3%	1,094

In 1913, in institution A, the Widal reaction of the blood of 1,179 persons was studied. In all these cases the reaction was absent before injection of the vaccine. The blood was then examined at the time of each injection and, if the reaction was not present at the time of the third dose, later periodical examinations were made. At some time following the injection 1,094, or 92.8 per cent., showed agglutinins in the blood. The blood of 44, or 3.7 per cent. showed a partial reaction and in the blood of only 41, or 3.5 per cent. the reaction was absent. Of these 1,094 cases showing the reaction present in the blood, 381 or 34.8 per cent., were present at the time of the second dose, 441, or 40.3 per cent. at the time of third dose, 155, or 14.2 per cent, ten days after the third dose and in 117, or 10.7 per cent. the reaction was delayed, appearing only after two, three or four weeks had elapsed. In 206 cases the reaction appeared more gradually as expressed by a partial agglutination occurring before a complete reaction appeared. In Table I is given a detailed account of these examinations.

Of the cases showing only a partial reaction, there were 44 and of these, 19 very quickly lost all trace of agglutinins. Table II gives an analysis of these examinations.

TABLE II.

AN ANALYSIS OF 44 CASES IN WHICH AN ATYPICAL REACTION OCCURRED (1913).

	At time of 2nd dose.	Time of 3rd dose.	10 Days after 3rd dose.	2 Weeks after 3rd dose.	3 Weeks after 3rd dose.	4 Weeks after 3rd dose.	Later.	Total.
Followed by atypical reaction.....	2	10	7	2	1	1	2	25
Followed by negative reaction....	1	10	6	1	1	0	0	19
Total........	3 6.8%	20 45.5%	13 29.6%	3 6.8%	2 4.5%	1 2.3%	2 4.5%	44

In 1914 immunization of those having entered the institution since the previous vaccination was undertaken. The Widal reaction was studied in 546 cases in which the blood failed to show agglutinins before the administration of vaccine. Of these, 372, or 68.2 per cent. showed the presence of the Widal reaction in the blood following the immunization. In the blood of 74, or 13.6 per cent., only a partial agglutination was found and in 100, or 18.2 per cent., the reaction was absent.

TABLE III.

AN ANALYSIS OF 372 CASES SHOWING THE TIME OF PRIMARY APPEARANCE OF THE WIDAL REACTION (1914).

	At time of 2nd dose.	At time of 3rd dose.	10 Days after 3rd.	Later.	Total.
Preceded by negative reaction..........	75	197	6	6	284
Preceded by atypical reaction..........		72	8	8	88
Total..........................	75 20%	269 72.3%	14 3.8%	14 3.8%	372

An analysis of the 372 specimens giving a reaction shows 75, or 20 per cent., positive at the time of the second inoculation, 269, or 72.3 per cent., positive at the time of the third injection and 14, or 3.8 per cent., ten days after the third dose, with 14, or 3.8 per cent. having the reaction delayed several weeks—88 of these 372 cases showed an atypical reaction before finally developing a positive.

Of the 74 cases in which the reaction was only partial, 39 very quickly showed the reaction absent on later examination.

TABLE IV.

AN ANALYSIS OF THE 74 CASES IN WHICH AN ATYPICAL REACTION OCCURRED (1914).

	At time of 2nd dose.	At time of 3rd dose.	10 Days after 3rd.	Later.	Total.
Followed by atypical reaction..........	5	13	5	12	35
Followed by negative reaction..........	15	14	1	9	39
Total............................	20 27.0%	27 36.5%	6 8 1%	21 28.4%	74

From a comparison of these two series in the same institution it will be seen that 92.8 per cent. of the cases in one series and only 68.2 per cent. in the other at some time gave a positive Widal reaction. Concerning this variation Dr. C. C. Burlingame* reported that 90 per cent. of those in the later series who failed to show agglutinins were vaccinated by one physician. This physician vaccinated in all 205 persons, or 11.9 per cent. of the total number and, of these, 90 or 44 per cent., failed to show the reaction. If the group of persons vaccinated by this one man are omitted from the 1914 series the percentage of cases showing the Widal reaction absent is 2.9 as compared with 3.4 for the 1913 series. It is interesting to note that the only case of typhoid fever in the vaccinated has occurred in this group of 90 persons. Clinical diagnosis in this case was confirmed by the isolation of *B. typhosus* from the stools. One case among those vaccinated in 1913 developed symptoms of typhoid fever in September, 1914, but from the stools only *B. paratyphosus* was isolated.

In order to determine the length of time agglutinins remain in the blood following vaccination, later examinations were made at approximately six months and one year after completion of immunization. Owing to the fact that from 20 to 25 per cent. of the patients of such institutions are being constantly discharged, and on account of the mental condition of many, it was not possible to obtain later specimens of blood from all. This was done, however, from 805, 770 of whom had shown the reaction present, 24 atypical and 11 absent. In all showing the reaction atypical or absent on completion of immunization the reaction was not present on later examination. Of the 770 showing the reaction present on completion of immunization, 177, or 23 per cent., showed it present at later examination, 68, or 8.8 per cent., showed an atypical reaction and in 525, or 68.2 per cent., the reaction was absent. A few of the cases had but one later examination but the majority had two. Tables V and VI analyze these results.

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*C. C. Burlingame. Read before Minn. State Medical Society, Oct., 1914.

TABLE V.

AN ANALYSIS OF THE WIDAL REACTION ON LATER EXAMINATIONS OF 770 CASES SHOWING REACTION PRESENT ON COMPLETION OF IMMUNIZATION.

Reaction first present.	Present at later examination.	Atypical at later examination.	Absent at later examination.	Total.
At time of 2nd injection....	73	28	172	273
At time of 3rd injection....	88	26	197	311
10 days after 3rd injection..	6	8	90	104
2 weeks after 3rd injection..	6	4	31	41
3 weeks after 3rd injection..	1	0	13	14
4 weeks after 3rd injection..	1	1	17	19
Later than 4 weeks after 3rd injection..............	2	1	5	8
Total...............	177 23%	68 8.8%	525 68.2%	770

TABLE VI.

LENGTH OF TIME FOLLOWING IMMUNIZATION THAT WIDAL REACTION STILL REMAINED PRESENT IN BLOOD OF 177 CASES.

Reaction first present.	6 mos. +	6 mos. + 1 yr. +	6 mos. + 1 yr. A.	6 mos. + 1 yr. –	6 mos. A. 1 yr. –	6 mos. – 1 yr. +	1 yr. +	Total.	Total 6 mos. +	Total 1 yr. +
At time of 2nd dose.........	9	15	3	33	1	1	11	73	60	28
At time of 3rd dose.........	4	32	10	19	8	13	2	88	65	55
Following 3rd dose.........	1	1	0	4	0	5	5	16	6	11
Total........	14	48	13	56	9	19	18	177	131	94

From these results it is seen that the Widal reaction following the administration of typhoid vaccine is of short duration. In a very small percentage of cases it is still present after six months' or a year's time has elapsed. In this series it was present after six months in only 16.3 per cent. of the persons vaccinated, or only 17 per cent. of those showing a Widal reaction upon completion of vaccination, and after one year in 11.7 per cent. of those vaccinated, or 12.2 per cent. of those showing the reaction previously. This agrees with the results obtained by Wollstein* on twenty-four cases studied in 1912. She found the reaction present in the highest dilution one month after the third inoculation, that it then fell rapidly during the next two months and at the end of thirteen months the large majority were entirely negative. Block and Creuzé† using vaccine Chantemesse found the agglutinins to reach their maximum one month after beginning immunization. They then gradually decreased until at the end of one year only half of the subjects showed agglutinins at a dilution of 1: 100.

Some variability in the presence of the reaction was noted in these series. This also was observed in one member of the laboratory staff in whose blood the reaction was absent when examined five months after vaccination, although present upon completion of immunization, and then reappeared and was found when the blood was examined 18 months after inoculation.

Early in 1914 institution B had a number of patients taken sick with typhoid fever and the hospital staff started an investigation to determine the source of the infection. It was claimed that until this outbreak no cases of typhoid fever had occurred in this institution for a number of years, but search of the hospital records indicated that undoubtedly the disease had occurred but had not been recognized, as symptoms in feeble-minded patients are different from those in normal individuals. Epidemiological investigation made by Dr. H. A. Burns of the State Board of Health pointed to one or more typhoid carriers as being the cause of this outbreak, and the authorities were urged to immunize all residents of the institution. This epidemiological evidence was confirmed later by laboratory examinations. The resident population is about 1,700. The immunizing was commenced in May, 1914, and was completed in August.

Blood specimens were received from 1,396 persons before the administration of vaccine and, of these, 1,376 showed the reaction to be absent. From these cases second specimens of blood were obtained anywhere from ten days to a month following the third inoculation. Of these, 509, or 37 per cent., showed the reaction present; 261, or 19 per cent., showed an atypical reaction and in 606, or 44 per cent., the reaction was absent. It will be noticed that the percentage of reactions in this case is quite different from that in institution A.

Late in September, about one month following the completion of the immunization, another outbreak of typhoid fever occurred in this institution. Investigation of this outbreak by Dr. W. P. Greene of this Division showed that the typhoid carriers in the institution had not been kept away from contact with the food and water supplies, although they had been excluded from the kitchen and dining rooms. There were found to be two possibilities for the infection, one through the milk supply, and one through contamination of a spring. The spring is located between the main dormitories and farm and it was customary for about 200 persons to stop there each day for water on their way back and forth. The water runs into a stone bowl about two feet deep and in the fall of the year this bowl occasionally gets filled with leaves. This had happened in September and some of the boys had gotten into the bowl to clean it out. A frequent attendant at this spring was an unrecognized case of typhoid. It could not be definitely learned if he had gotten into the bowl himself. Hands were more popular than cups for conveying water to the mouth. The son of the superintendent of the farm had been in the habit of playing around this spring and had developed typhoid fever.

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* *Journal Experimental Medicine*, 1912, XVI, 315.

† Comp. Rend. Soc. de Biologie, 1912, LXXIII, 566.

Regarding the milk supply, it was learned that the wife of the head dairyman was ill with typhoid fever and was being cared for nights by the dairyman himself. He himself was found during the progress of the epidemic to be a walking case of typhoid fever. This man was caring for the milk during the day and cans and containers of various sorts were being constantly carried back and forth from the dairy barn to the dairyman's house. The same case of walking typhoid who attended the spring also helped in the milking as did one suspected carrier.

With these two possible and probable sources of infection it can be realized that the chances of an epidemic were very great. The fact that the large majority of persons were vaccinated undoubtedly accounts for the fact that not more cases occurred in a population of approximately 1,700. Symptoms in these patients were complicated by the occurrence of a diphtheria outbreak at the same time and a number of double infections occurred. In three persons a doubtful diagnosis of typhoid fever could not be confirmed by the Widal test, the reaction remaining persistently negative although examined as late as the 26th day following first recognized symptoms. Specimens of feces and urine from these persons were examined November 13. No typhoid bacilli were found. These three persons are not included in the following analysis of cases.

In all 55 cases occurred, including 3 cases of paratyphoid fever, 16 amongst the unvaccinated and 37 amongst those vaccinated. Of the 16 unvaccinated, 11 were employees. The diagnosis was confirmed by positive Widal reaction in 15 cases, the other case left the state and so no blood specimen was obtained. Amongst the unvaccinated two deaths occurred. Of the 39 persons vaccinated, 34 did not show the presence of the Widal reaction following immunization but have shown it during the present illness and therefore are considered as typhoid fever. Three of these cases ended fatally. The diagnosis has been further confirmed by isolation of *B.*

typhosus in two cases, and *B. paratyphosus* in three cases. A more detailed account of the five cases showing the Widal reaction present follows:

A. E., male, 18. Vaccination completed June 22, 1914. Widal reaction present July 1. First recognized symptoms September 24. Blood culture September 30 sterile. Blood specimens September 26 and October 30 failed to give the Widal reaction. On October 10, throat cultures showed the presence of *B. diphtheriæ*. Specimens of feces and urine collected October 5, November 4 and November 8 were submitted to the laboratory. No typhoid bacilli were found.

H. S., male, 30. Vaccination completed May 28, 1914. Widal reaction present June 8. First symptoms September 26, high fever. On September 30, blood culture taken and *B. typhosus* identified. Death occurred October 3. An incomplete autopsy was performed by the hospital authorities two days after death and only badly contaminated cultures from the spleen and heart's blood were submitted to the laboratory. The only intestinal lesion was a small ulcer which in itself could scarcely account for death. Shortly after his death diphtheria was found to be present in the institution and one death from clinical diphtheria occurred October 10. It is unfortunate that no examination of the throat was made at any time and that no throat cultures were taken from this patient as it is believed death was due to diphtheria.

J. B., male, 32. Vaccination completed June 25. Widal reaction present July 8. First symptoms September 28. Widal reaction still present October 3. When examined October 10 tongue was found to be coated but no rose spots and no enlarged spleen found. Throat culture October 10 showed the presence of *B. diphtheriæ*. The hospital physician believed this to be a case of typhoid fever complicated by diphtheria. Feces and urine obtained November 4 and November 7 were submitted to the laboratory. No typhoid bacilli were found.

E. T., male, 20. Vaccination completed May 23, 1914. Widal reaction present June 3. First recognized symptoms October 1. Blood specimen taken October 3 still gave Widal reaction. Specimens of feces and urine submitted to the laboratory November 4 and November 7 failed to show typhoid bacilli.

H. J., male, 13. Vaccination completed June 4, 1914. Widal reaction present July 1. First recognized symptoms about October 26. Widal reaction still present October 30. Specimens of feces and urine submitted to the laboratory November 4 and November 7 failed to show typhoid bacilli.

Of these five cases, the diagnosis in but one has been confirmed by isolation of typhoid bacilli. Considering these five cases to be typhoid fever, we have only five out of the 39 cases giving the Widal reaction following vaccination.

At the XV International Congress of Hygiene and Demography, Dr. J. W. Brannan* asked the significance, if any, of the Widal reaction following vaccination. Not only was no response given to this question but a search of the literature failed to reveal much recorded information upon this point. Nègre† experimenting upon rabbits used three different vaccines. He found that animals immunized by ether-killed organisms showed a very high agglutinating power (1: 10000) while the bactericidal action was very weak and the antibody content very low. In contrast with this the living sensibilized bacilli produced a relatively low agglutinating power (1: 1000), a strong bactericidal action and a high antibody content. Typhoid bacilli killed by heat (56° C. for 1 hour) produced a high agglutinating power (1: 7000), a weak bactericidal action and an antibody content almost as high as that produced by the sensibilized vaccine. Further studies upon the relationship of the various factors entering into immunity must be made before the exact significance of the Widal reaction can be stated.

While agglutinins have been found in the blood of all or nearly all immunized persons by most observers, it appears that they are not present in a small percentage of cases. In a member of our laboratory staff three additional doses of vaccine of 1 cc. each were given, the six injections being made at ten-day intervals. Repeated examinations of the blood in this case failed to show agglutinins in a dilution of 1: 50. This same result was obtained by Maverick‡ in a patient to whom he had administered three successive vaccinations.

No one perhaps is as well able as are laboratory workers to understand how difficult it is to succeed in getting directions followed even when the execution of them is very simple, especially if the one using the directions is halfhearted or indifferent to the work. In institution A the obtaining by one physician of 44 per cent. of cases showing the reaction absent as compared with only 3.4 per cent. by all other members of the staff seems to offer in itself sufficient explanation for the lowered percentage of Widal reactions in the 1914 series in this institution. For the same variation in the results in institution B, where the blood of 44 per cent. of all vaccinated persons failed to give the Widal reaction, the writers have no explanation to offer.

One may properly ask if the vaccine was at fault. We ourselves have looked to the vaccine for an explanation. The only difference in the vaccine used was that in the 1913 series a temperature of 58° C. for one hour was used while in the 1914 series in institution A and in institution B only 55° C. was used for the same length of time. Further, the same lots of vaccine were widely distributed with the usual percentage of positive reactions in those from whom blood specimens were received for examination. Also this same vaccine has afforded protection in an epidemic caused by contamination of the water supply as shown by the fact that the only secondary case was that of a person refusing to be vaccinated. In this epidemic there were 110 cases of typhoid fever in a population of 1,800.

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* Trans. XV. Int. Congress of Hygiene and Demography, 1912, Vol. 4, p. 223.

† Comp. Rend. Soc. de Biologie, 1913, LXXIV, 1177.

‡ Jour. A. M. A. 1912, LVIII, 1672.

The incidence of cases of typhoid fever in institution B in the group of vaccinated persons showing or failing to show the Widal reaction seems to indicate that a high degree of protection was afforded to those in whom a positive reaction followed the administration of the vaccine. The one case of typhoid fever in institution A among the vaccinated occurred in one in whom the reaction had been absent.

The occurrence of typhoid fever among immunized persons points very urgently to the need of sanitary conditions, including especially supervision of typhoid carriers even in vaccinated communities. Dr. L. L. Lumsden* emphasized this very strongly when he said "There seems to have arisen an undue amount of enthusiasm about antityphoid inoculation. It is well enough to arouse enthusiasm for any measure which will be of use in typhoid prevention, but we should not lose our perspective and attach too much importance to one measure to the neglect of other and equally important measures. I think inoculation should be regarded as a useful adjunct to, but by no means a substitute for, sanitary and hygienic precautions in campaigns against typhoid fever."

In these two institutions there were 74 individuals in whom the blood showed the Widal reaction to be present or atypical before inoculation. A certain number of these persons have been shown through the examination of their feces and urine to be carriers of typhoid or paratyphoid bacilli. These cases are reported elsewhere.† The difficulties of isolating these organisms from discharges which have been long in transit are very great. The best methods of handling such specimens we believe need further study and it is suggested that this Association appoint a committee for the study of this problem.

The writers desire to extend to Dr. C. C. Burlingame their sincere thanks for his hearty coöperation which has made possible a large part of this investigation and to Dr. E. H. Trowbridge who has also willingly coöperated in this work.

Conclusions.

1. The blood of persons immunized with typhoid vaccine prepared according to directions of the U. S. Army should show the presence of the Widal reaction at a dilution of 1:50 in the large majority of cases, probably about 90 per cent.

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* Trans. XV. Int. Congress of Hygiene and Demography, 1912, Vol. 4, p. 224.

† Read before Public Health Officials' Section, A. P. H. A., 1914.

2. Failure to find this high percentage of positive Widal reactions in persons thus vaccinated appears to indicate some technical error in methods and an accompanying failure to confer full immunity.

3. In communities where paratyphoid fever occasionally appears, especially in institutions, it might be preferable to use a mixed vaccine of typhoid and paratyphoid after the recommendation of Castellani.*

4. In institutions in which typhoid fever exists persons should be immunized upon admittance.

5. In institutions where typhoid carriers are usually present they should be detected and properly supervised.

6. Vaccination alone must not be considered the only necessary prophylactic measure to be taken against the occurence of typhoid fever.

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* *British Med. Jour.*, 1913, II, 1577.

THE LABORATORY DIAGNOSIS OF BUBONIC PLAGUE.

J. F. Anderson,
Director of the Hyienic Laboratory.

Read before the Laboratory Section, American Public Health Association, Jacksonville, Fla., November 30–December 4, 1914.

The papers by McCoy, by Creel and by Currie, especially that by McCoy, give excellent descriptions of the diagnosis of bubonic plague, particularly in rats. In view, however, of the appearance of the disease in New Orleans, and the possibility of its occurrence in other places, it was thought that a brief review of the important points to be observed in the laboratory diagnosis of the disease would not be out of place. For a fuller discussion of the diagnosis of rat plague, I would refer to the article by McCoy on "Plague Infection in Rats" and on which I have drawn liberally in the preparation of this paper. I shall first take up the diagnosis of rat plague, and shall only mention in order to call attention to their importance, the necessity of killing the ecto-parasites of the rat, recording the locality of origin, etc.

The rat should be nailed to a[*] shingle or small board and then the skin should be reflected from the entire front of the body and neck so as to expose the cervical, axillary, and inguinal regions; the thoracic and abdominal cavities are then opened with scissors. Careful search should be made for buboes in the region of the peripheral lymph glands and the abdominal and thoracic organs carefully noted for certain appearances to be later described. The disease causes in rats certain naked-eye lesions which are distinctive and characteristic, and the presence of which render it possible to make a positive diagnosis in the great majority of cases.

The greater number of rats may be put aside as entirely beyond suspicion but a certain number will require a close examination for the gross lesions.

The important naked-eye findings to be looked for in the diagnosis of natural rat plague are:

(a) Subcutaneous injection,
(b) The bubo,
(c) The granular liver,
(d) The condition of the spleen,
(e) Pleural effusion.

Subcutaneous Injection.

This is the sign which usually first attracts attention. White, in discussing plague in rats, states that "the most noticeable postmortem appearance of the plague rat is the engorgement of the subcutaneous blood vessels, together with a diffuse pink color of the subcutaneous muscles, which have a peculiar dry, waxy translucency." The injection is dark red, and upon close inspection the small vessels are seen to be uniformly distended with blood. It is usually distributed over the whole surface of the body, but occasionally it is confined to the side of the body on which the primary bubo was found. A bright pink injection is a rather common finding, but it is not likely to be mistaken for the injection of plague infection. Subcutaneous edema, confined to the vicinity of the bubo, is occasionally encountered.

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[*] "The rat and its relation to the public health," *Public Health Bulletin*, No. 30, 1910, 254 p.

In a series of sixty-one consecutive plague rats in San Francisco, injection was present fifty-two times; it was confined to the region of the bubo twice; it was unilateral twice; and was general in distribution forty-eight times. It was slight thirteen times, moderate fifteen times, marked sixteen times, intense eight times.

THE BUBO.

This is possibly the most reliable single sign of plague infection.

The gland involved is usually surrounded by a more marked injection than is present elsewhere, and an infiltration which at times is hemorrhagic. The gland proper is usually caseous. The contents may be shelled out very readily, though prior to section the gland feels very firm. In the cases seen in San Francisco, the contents of the buboes were recorded as being hemorrhagic four times and as caseous twenty-nine times. Pestlike bacilli were noted as present in eighteen cases, in six of which the "coccoid" form predominated. They were recorded as absent five times.

Indolent enlargement of the lymph glands is very commonly encountered in rats that are not infected with plague. Among old rats probably 15 per cent. will show this. Such glands, however, are tough, elastic, and not surrounded by infiltration. They are not likely to be mistaken for the plague buboes. In the leprosy-like disease of rats, the glands may reach an enormous size.

THE GRANULAR LIVER.

Two lesions of the liver are encountered in plague rats. The one most frequently observed is spoken of by the Indian Plague Commission as "fatty" change, though it is explained that this term refers to the naked eye appearance, as microscopically the lesion is found to be due to a necrosis of the liver tissue. When this change is present the organ is found to be rather yellowish in color and is studded with an enormous number of yellowish-white granules which are about the size of a pin head. This lesion, which was very common in the San Francisco cases, is very readily recognized.

The other lesion is a marking of the organ with grayish-white spots; "they are typically of the size of a pin's point, and give the surface of the organ a stippled appearance as if dusted over with gray pepper." This appearance, which is less frequently encountered than is the preceding one, is more difficult to recognize; indeed the most careful scrutiny is necessary to avoid overlooking it.

Rats that have been fed with certain biological preparations used to destroy rodents (Danysz's virus and similar preparations) often present lesions in the liver resembling those due to plague infection. The granules are, however, larger and more distinct. In these cases the spleen is enlarged and generally granular, but rarely dark and friable, as in plague infection.

THE SPLEEN.

The size of the spleen of healthy rats of the same weight varies so greatly that often one cannot be sure as to what constitutes an enlargement of this organ.

In plague rats this organ is markedly enlarged, firm, friable, rather dark in color, and occasionally presents small granules under the capsule. These granules are not encountered as often as are granules in the liver. At times the organ presents a very distinctly mottled appearance. This latter appearance is much more frequently seen in artificially inoculated rats than in those found infected in nature. The organ is occasionally distinctly slate-colored.

PLEURAL EFFUSION.

This sign of rat plague is of great importance when associated with other suspicious lesions. The effusion is bilateral, and is serous in character, usually clear, though it is occasionally blood-stained. Pleural effusion is rarely found in rats other than those that are plague-infected.

The following table shows in percentage the frequency of the various macroscopical lesions of acute natural rat plague, as observed in Bombay and in San Francisco:

	Subcutaneous injection.	Bubo.	Granular liver.	Large dark spleen.	Pleural effusion.
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Indian Plague Commission, Bombay—4,000 rats.	69	85	58	. . . .	72
Wherry, Walker, and Howell, San Francisco—88 rats.	59	14	14	68	71
Federal laboratory, San Francisco—62 rats.	85	57	87	74	59
Average.	71	52	53	71	67

It is not usual to find all five of the lesions present and no single sign of itself is pathognomonic but it is the combination of two or more signs that is of moment. The subcutaneous injection with a typical liver or these signs associated with a typical spleen afford good grounds for a diagnosis. The presence of a typical liver and a pleural effusion usually means plague and if a large, dark, firm spleen be present the diagnosis of plague may be made.

The gross lesions of plague may often be distinguished even in rats in an advanced state of decomposition.

Chronic plague, or as it is sometimes called "resolving plague," in rats sometimes occurs but it is very rare and the lesions usually consist of purulent or caseous foci in the peripheral lymph glands, spleen, or other viscera. In these lesions plague bacilli are either scanty or are not found on microscopical examination but they may be frequently recovered by cultural or inoculation methods.

It should be kept in mind that occasionally a rat may harbor plague bacilli without recognizable gross lesions but such an occurrence is rare.

The exact weight to be given to the morphology of the organisms found in smears from the organs of a rat suspected of being plague-infected is a matter of individual judgment. Smears from a bubo and from the spleen may show no organisms at all, or none even remotely resembling *B. pestis*, and yet by culture and inoculation methods we may be able to demonstrate that the animal is plague-infected. Attention has been called to this point by several observers and every worker in this field has the experience sooner or later.

In other cases the smears will show such numbers of perfectly typical bipolar bacilli and "involution" (coccoid) forms as to leave scarcely any doubt as to the nature of the organism. But even here cases that are not plague are encountered that will deceive even the most experienced.

In addition to these two classes of cases we have a third, where smears show a few typically-shaped bacilli, or where a considerable number of typical-looking bacilli are found along with many other bacterial forms. There is no safe rule for reaching a conclusion in these cases, and one must resort to culture or to inoculation methods, or both. In any such case it is always a good plan to let the macroscopical findings have more weight than the microscopical.

The bipolar appearance of *B. pestis* is so largely dependent upon the technique of staining, fixing, length of time the stain is allowed to act, and the length of the washing that it should never be given great weight. Here, as elsewhere in bacteriology, many errors are to be avoided by not depending too much upon the morphology of the organism under investigation.

While the gross lesions of rat plague are often sufficiently characteristic to justify a positive diagnosis, and the gross lesions in conjunction with the microscopical examination will in other cases enable us to say definitely that a rat is plague-infected, still a certain number of cases occur in which it is necessary to resort to other methods, and there are circumstances, such as the first case in a community, that make a complete bacteriological confirmation of a diagnosis necessary.

B. pestis may often be isolated in culture from the tissues (bubo, liver, spleen, or heart's blood) of an infected rat. Unless the tissues are badly contaminated with other organisms, plate or stroke culture will yield a growth of *B. pestis* in pure culture, or isolated pestlike colonies may be transferred to other media.

It is unwise, however, to trust to cultural methods alone. In the majority of doubtful cases it is advisable to inoculate guinea pigs or white rats. The lesions of plague in these animals are quite characteristic, and *B. pestis* may readily be recovered from their tissues if cultures are made immediately after death.

A pure culture of the organism under suspicion is obtained from the naturally infected animal or from a laboratory animal inoculated from the one under suspicion. This culture is studied in regard to its morphology; first, on agar, where it grows as a short rod, or often in the shape of a coccus; second, in broth, where it often grows in streptococcuslike chains; third, on agar containing 3 per cent. sodium chloride, where most extraordinary alterations in morphology occur, giving large balloon-shaped bodies, objects resembling gigantic cocci and enormous trypanosome-shaped forms, the so-called "involution" forms. These involution forms must not be confused with the so-called "involution" (coccoid) forms of the organism found in smears from animal tissues.

The great diagnostic value of involution forms developed when *B. pestis* is grown on salt agar should be noted. No other organism gives forms that are at all likely to be mistaken for those of *B. pestis*, except B. pseudo-tuberculosis rodentium (Pfeiffer) which can only be differentiated by animal inoculation.

B. pestis is Gram negative, though this point is of no great value except to distinguish the "coccoid" forms from pus cocci.

The appearance and character of the culture should be as follows:

Agar.—Smooth, glistening, round, whitish colonies, which are found to be sticky when touched with an inoculating needle.

Broth.—A scanty surface growth which falls, often in globular masses, when the tube is gently agitated; and a fine flocculent precipitate.

Litmus Milk.—Generally rendered slightly acid.

Glucose Broth.—Rendered slightly acid. Gas is not formed.

Lactose Broth.—Unchanged in reaction. Gas is not formed.

In routine work the appearance of the growth on agar and in broth, together with the involution forms on salt agar, is sufficient for identifying the organism.

The plague bacillus is a nonmotile organism.

A culture answering the above description when rubbed into the shaven skin of a guinea pig or a white rat should cause the death of either of these animals by plague within 10 days, and an organism must be isolated from their tissues after death corresponding to the one inoculated.

If one wishes to be doubly certain, one may inoculate a series of laboratory animals, giving to half of them a sufficient dose of anti-pest serum. The protected animals should recover, or markedly outlive the controls, which should die in the usual time.

The preference should be given to the cutaneous method of inoculation, which is of special value when used for the inoculation of rats or guinea pigs with the tissue of animals suspected of plague.

Kolle and Martini (9) compare the cutaneous method of inoculation to the use of an agar plate in separating plague bacilli from other organisms, and so regularly does *B. pestis* penetrate the skin and infect the animal, and so rarely do other organisms do this, that it offers a certain and accurate method of "filtering out" *B. pestis* from any badly decomposed tissue.

The technique of the cutaneous method of inoculation, or "vaccination," as it is sometimes called, is very simple. An area about an inch square is shaven on an animal's belly, taking care to abrade the epithelium slightly. The culture or suspected tissue is rubbed on this shaven area with a platinum loop, a scalpel, or a dressing forceps. Guinea pigs when inoculated in this manner generally die before the seventh day; white rats die a day or two earlier.

There are a number of organisms sometimes found in rats that in smears from tissues are scarcely to be distinguished from the plague bacillus but they can usually, without great difficulty, be separated therefrom by cultural and animal tests. Great care must be exercised in expressing an opinion based on the appearance of an organism in smears. It is always advisable to confirm the diagnosis made by the naked-eye findings by inoculation either of white rats or guinea pig.

Practically we may confine our study to inoculation by the cutaneous method and to subcutaneous inoculation when the material is injected in the ordinary manner. A useful modification of the latter method is to make a small pocket under the skin of the abdomen and thrust the suspected material into this pocket. The time that elapses between the inoculation of a rat with a virulent culture of plague bacilli and its death varies somewhat with the size of the dose and with the mode of inoculation.

The *lesions* found, when an artificially inoculated rat is examined after death, are in a general way similar to those found in naturally infected rats with certain modifications.

The most striking difference between natural and artificial plague in rats is the presence of a reaction at the site of inoculation in the majority of cases where the organism is introduced subcutaneously, and in about a third of the cases where the infectious material is rubbed on the shaven skin (cutaneous inoculation). The local reaction may exist only as a yellowish-brown crust overlying a granulating surface, and associated with a trifling thickening of the skin and subcutaneous tissue. It may appear as one or more firm papules 3 or 4 millimeters in diameter. The most frequent appearance is a brawny, edematous and blood-stained reaction, which extends over an area perhaps an inch in diameter; at times purulent change may be well advanced. Very rarely one finds so extensive anedema as to cause the lesion to somewhat resemble the widespread gelatinous reaction seen so commonly in the guinea pig. Occasionally an extensive slough may be at the site of inoculation.

It is very exceptional that one finds in cases of induced plague the typical, firm, caseous bubo surrounded by an infiltrated area, as is so commonly seen in natural infection in rats. The glands are sometimes enlarged and injected without other changes. The commonest lesion, however, is a markedly enlarged gland which upon close inspection is seen to have a number of yellowish points just under the capsule. These points are especially well seen when a section is made through the gland. The gland may be squeezed out of the capsule, and it breaks down readily enough when pressure is made upon it, but the uniform necrotic process that one sees so often in natural rat plague is absent.

Granular lesions in the liver precisely like those found in natural infections are very common. If the rat dies on the sixth day or later, the ordinary lesions are apt to be replaced by necrotic foci that may be as much as 2 millimeters in diameter.

The spleen is found mottled more frequently than in natural plague infection, and large granules are much more common.

The subcutaneous injection is rarely so well marked as it is in natural infections.

Pleural effusion of the same nature as that found in natural plague is common. Hemorrhagic foci are not rare in the lungs, and occasionally the organs are partly consolidated.

The lesions of plague in the guinea pig are in general similar to those in the rat but with certain important differences.

Guinea pigs inoculated with a culture of plague or with plague tissue usually die in from four to eight days. At autopsy on reflecting the skin a more or less extensive gelatinous, sometimes blood-stained, exudate will be noted; this exudate extends from the site of inoculation. One or more of the external lymph glands are enlarged to form a bubo, frequently caseous, surrounded by an exudate that is usually more or less hemorrhagic. The spleen is enlarged, often two or three times the normal size, studded with whitish granules, varying from the size of a pin point to a split pea. The liver frequently shows a few whitish spots, and the same may be found in the lungs.

Cultures made from the heart blood and from tissues such as the spleen or bubo will yield a growth of the bacilli, giving the culture reactions previously described for the plague bacillus. Smears made from the cut surface of the bubo or the other tissues will show the presence of large numbers of the bacilli.

Until the disease has gained a foothold in a community the materials other than rats, usually presented for examination, are tissues obtained at autopsy. Occasionally fluid from a bubo or blood from a suspected case may be obtained during life and these are subjected to microscopical, cultural and animal tests.

In routine work after the presence of the disease in a community has once been positively demonstrated it is permissible provisionally to consider as *B. pestis* any nonmotile, Gram negative organism giving a characteristic growth on agar and in broth, and showing well marked involution forms after 24 hours on 3 per cent. salt agar. In the diagnosis of the first case in a community or to confirm the provisional diagnosis according to McCoy the following steps should be taken:

The organism after having been obtained in pure culture should be examined for motility and morphology. Its cultural reactions on media should be studied, especial attention being given to its morphology on salt agar. The inoculation of the culture in rats and guinea pigs should produce the lesions previously described and the characteristic organisms recovered from those animals. Finally the organism should be tested against anti-pest serum, the animals receiving the serum surviving or living longer than the controls.

Such a procedure requires considerable time and for all practical purposes a positive diagnosis may be made by rubbing the material from a suspected case, rodent or human, on the freshly shaved belly of a guinea pig and of a rat. If both animals die, and at autopsy present the lesions of plague previously described, the diagnosis of bubonic plague may be considered as established.

THE PHYSICAL EXAMINATION OF THE EMPLOYEES OF THE NEW YORK CITY DEPARTMENT OF HEALTH.

CHARLES B. SLADE, M. D.

Read before the Section of Vital Statistics, American Public Health Association, Jacksonville, Fla., November 30–December 4, 1914.

In a recent paper advocating the periodic medical examination of all people as a means for the prevention of avoidable physical deterioration and disease, Dr. S. S. Goldwater declared that "the Department (of Health) must assume the leadership in this great movement for the preservation of health and the prolongation of life." At the same time he announced that the Department offered to all in its employ a complete medical examination by a trained medical examiner free of charge. This plan was put into actual operation in June of this year.

The history and record card employed in these examinations is as concise as the essentials of a complete examination permit. On the reverse side of the card are blanks for recording absences from duty. Thus, the cards will contain complete records for the estimation not only of the medical findings, but also of the results in absences on account of illness.

At this point it would not be amiss to suggest the importance of adopting a uniform card to be used by all agencies engaged in this branch of work.

To reduce to a minimum the friction inevitably associated with the introduction of any innovation it was decided to have all female employees examined by a female physician and all male employees examined by a male physician. This seems, thus far, to have been a wise precaution.

The employees were given clearly to understand that the examinations were offered for them to accept voluntarily. They were in no sense obligatory. They were solely for the good of the employees, and the results were to be held strictly confidential. This has been practised to the letter, and to insure the privacy of all records each card bears a number, in place of the employee's name, corresponding to the same number opposite the employee's name in an index book which is held, under lock and key, by the Deputy Commissioner.

At first there was some hesitation on the part of many employees to submit to the examination. This hesitation has now almost completely disappeared, and in every examination I have made I have been repaid by a genuine expression of appreciation.

In the interpretation of our findings we have attempted to avoid any fixed and narrow standard of the normal. A rigid limitation in the interpretation or classification of good health would, by indicating irksome treatment for more than 50 per cent. of all people, soon accomplish its own condemnation.

Our first examination was made on June 22, and on October 22, we had completed 696 examinations, from which the following results have been obtained. These statistics are peculiarly representative because they are derived from the examination of persons of all ages from 15 to 74 years, and of a wide social and educational range, from the laborer to the highest executive officers of the Department; a variety of indoor, outdoor and mixed employments are represented. It would, therefore, seem fair to assume that the percentage of physical defects found herein is no greater and probably is less, than those existing in the community at large.

In the 696 examinations analyzed, 240 were men and 456 were women. The average age of the men was 33½ and the average of the women 32 years. In the entire number, 20, or 2.8 per cent. were found to be over normal weight to such a degree as to be a hindrance to health and comfort. Forty-five, or 6.1 per cent. were not only under normal weight, but had recently lost considerable weight.

All had been vaccinated against smallpox, except one recently appointed employee, who has since been vaccinated.

Fifty, or 7.5 per cent. had been vaccinated against typhoid fever. Most of these were laboratory assistants, bacteriologists and physicians.

One hundred and twenty-three or 17.6 per cent. were found to have defective digestion. Habitual constipation was found in a majority of these. Constipation was by no means confined to women. A great number of young men suffered from this condition, which, if allowed to go uncorrected, has such baneful ultimate effects upon the blood vessels, kidneys, heart and nervous system.

None of the women admitted the use of tobacco in any form, and only one woman admitted the taking of alcoholic drinks. She takes "a little beer with meals, occasionally."

One hundred and fifty-nine men, of the 240 examined, or 66.3 per cent., use tobacco. Nearly all of these smoke to a greater or less degree. One hundred and thirty, or 54.1 per cent. of the men take alcohol in some form. Only five or six of these admitted ever taking it to excess, and these only on rare occasions. I am of the opinion that almost any data regarding the use of alcohol, which is based upon the statements of any such group, is unreliable.

Eyesight was found to be defective in 136, or 19.5 per cent. of our cases, and hearing was under standard in an even greater number.

The teeth needed attention or repair in 131, or 18.8 per cent.

Defects of the nose and throat, needing attention, were found in 8.9 per cent. of all.

Cardiac derangement, of varying degrees of severity and importance, were found in 92, or 13.2 per cent. This alone would be sufficient to justify the work. Many of these had valvular leakage of which they were entirely ignorant and complained, only upon close questioning, of occasional shortness of breath upon exertion. Others, especially very young men with constipation and nervousness, had dilated left ventricles with unstable and rapid heart action. Many of these young men, I found, were accustomed to stay up, on the streets, until near midnight or later, in occupation and company that was probably the chief cause of their physical defects.

Elevation of the systolic blood pressure, above 150 mm. Hg., with some albuminuria, was found in 25 cases, or 3.5 per cent. The lowest blood pressure recorded was 50 mm. systolic and 20 diastolic, in a woman of 29 years, who was not, otherwise, very unhealthy.

Some form of lung disease, active, quiescent, or healed, was found in 31, or 4.4 per cent. Change in occupation, vacations or other help for their improvement was arranged by the officers of the Department for those of this number in whom it seemed indicated. Some had such slight disease that they were allowed to continue at work, but were given explicit advice concerning their diet, hygiene, exercise, sleep, etc., to insure their improvement, if such were possible under city conditions. They were also instructed to return at a stated time for reëxamination.

Some defect or abnormality in the abdominal organs or wall was found in 34 cases, or 4.9 per cent.

Reflexes were absent in one case, which was of such recent development that strong hope is entertained for a cure of the tubes.

Albuminuria was detected to a slight amount in so large a number—30 per cent., that I am inclined to believe our tests are overfine.

Miscellaneous defects, which cannot be classified, were found in 27, or 3.3 per cent.

In the cases 696 analyzed, there were 232—or 33.3 per cent., who were in obvious need of medical advice. One hundred and seventy-two, or 24.6 per cent., were in actual need of treatment.

The number who needed either advice or treatment, or both, was 327—44 per cent. Forty-four in every hundred examined had, without their knowledge, some vital physical defect which might have shortened their lives, by a matter of years, if it had remained undetected.

Those in whom we discovered the early signs of disease in the digestive organs, heart, blood vessels and kidneys, combined, amount to 213, or 30 per cent. of the entire number.

When we recall the fact that, while the last decade has recorded a steady reduction in the general death-rate in all ages under 40, there has been a simultaneous increase in the death-rate between 40 and 60, due largely to digestive, circulatory and kidney diseases, we realize what an important influence universal medical examination would have in reducing the death-rate in those ages where it is now increasing.

While it is unquestionably true that a certain percentage of those in whom we find early signs of these diseases, would never develop the final stages of the diseases, many undoubtedly would, and would die from them. It is especially this group to whom precautionary medical examination would give a longer life and a life of greater fulness and comfort because a large number of these disease processes can be delayed, arrested or cured, if detected in their earliest stage.

There is one point which my analysis revealed that surprised me not a little. Although 123 had defective digestion and 131 had defective teeth, in only nineteen (19) did these two conditions fall in the same individuals. I had thought that many more than 19 of 131 people with defective teeth would have defective digestion, if from no other cause than imperfect mastication.

It is also interesting to note that of the 92 who presented cardiac derangements, only 14 suffered from defective digestion, and only 5 had abnormal blood pressure, 4 being elevated and one lower than normal. I am fully aware that many more points of interest could be extracted from our records if enough time, for the preparation of more elaborate statistical sheets, had been available. However this study shows that the extension to the community at large, of the plan now followed by the New York City Department of Health is safeguarding the health of its employees, would add several years to the life of the average individual. And, furthermore, in view of the recent surprising increase in the adult death-rate, it would add to the most efficient years of life.

In closing I would like to emphasize the great importance of maintaining the strictest confidence between the medical examiner and the persons examined, in any extension of this work to the community at large. In spite of any temptation that some heads of great organizations might feel to utilize the results of these examinations for the demotion or discharge of permanent employees, it would, I am convinced, be a serious blow to the popularity of this great movement, if the examinations were put to any such use. It is also easy to understand how harm, instead of benefit, would result from these examinations, if those examined were given an exaggerated impression of the importance of their slight deviations from the normal. Therefore, it is imperative, for the success of this work, that it be done only by physicians of good diagnostic ability, considerable experience and a ripe conservative judgment.

BOOK REVIEWS.

Fever: Its Thermotaxis and Metabolism. *By Isaac Ott, M. D. New York, Paul B. Hoeber, 1914. Pp. 166. Price $1.50.*

The author of this book has been engaged for many years upon experimental studies related to the subject which is here discussed. One opens the volume with the hope that it may contain a clear summary of these researches and of those conducted by others in the same field. The reader is destined to be disappointed. He will be interested in certain reports of specific trials but he will find the presentation as a whole confused and uncritical. Irreconcilable statements stand side by side in the text and we are not granted the benefit of the author's judgment in deciding to which we shall incline. The fundamental difficulty is increased by an unfortunate awkwardness of expression, a lack of punctuation, and an apparent omission of proof-correction.

Percy G. Stiles.

The Modern Factory. *By George M. Price, M. D., Director Joint Board of Sanitary Control in the Cloak, Suit and Skirt, and the Dress and Waist Industries, N. Y. City. Formerly Director of Investigation, N. Y. State Factory Commission. 8vo. XIV, 574 pages, illustrated. Price $4.00. John Wiley & Sons, Inc., New York; Chapman & Hall, London.*

This book contains an intelligent and interesting discussion of the history, principles, means, and methods of the preservation of the health of the workers in factories and industrial establishments.

The author's experiences, as Inspector for the New York Sanitary Society on Tenement House and Factory Commissions, and as Director of the New York State Joint Board of Sanitary Control, entitle him to be regarded as one who can speak authoritatively on the subject.

While the book is of value to students and expert authorities in occupational diseases, its greatest worth would appear to be in educating persons, now somewhat interested in the problem of protecting the health and safety of factory workers, to become still more interested and in some useful way consider some phase of factory life with a view of placing the work of factory sanitation and inspection on a higher basis in order to insure to factory workers reasonable protection to health, life, and limb.

The author wisely regrets that in most Factory Inspection Departments in the United States, "the detection of faults seems to be their main and most important function,"rather than the prevention of accidents and diseases. He deplores the lack of prominence in both the United States and Europe given to educational functions.

In commenting on the method of appointment of factory inspectors in the states, he quotes the following statement from a report issued by the International Civic Federation Committee, On Improvement of Factory Inspection in 1910:

"In nearly every state report, no examination is required for appointment as inspector. Two exceptions are New York and Wisconsin, where the reports state a civil service examination is required."

Since this statement was issued in 1910 many new laws have been enacted on the subject. Several other states, including Massachusetts, now require a civil service examination for the position of Industrial Health Inspector. It is to be regretted that a thorough and recent analysis of existing practices in the different states could not have been made, both from the legal and administrative viewpoints.

Illustrations and references to the contributions of various writers seem not so well chosen as they should have been in a work of this kind. Photographs of former and antiquated processes have little other than historical value, whereas in pointing out distinctly bad conditions now existing in some occupations, it is of the greatest importance that examples of good, or practically perfect conditions be also shown.

Notwithstanding any minor criticisms

that may be made in regard to the book, it deserves wide recognition and circulation for it is a very creditable attempt to bring about healthier and safer working conditions in the factories in this country through the best possible kind of state service and educational activities.

Wm. C. Hanson.

Public Health Laboratory Work. By *Henry R. Kenwood, M. B., F. R. S., Chadwick Professor of Hygiene and Public Health, University of London; Medical Officer of Health and Public Analyst for the Metropolitan Borough of Stoke Newington; Examiner in Public Health to the Royal Colleges of Physicians and Surgeons, etc. Sixth Edition, 8vo. Cloth, 418 pages. 87 illustrations. $4.00 Net.*

It is unfortunate that the laboratory practice in England and America differ so widely. This work was written for the laboratory man in England and hence loses a large share of its usefulness on this side of the water. Nevertheless the book will prove valuable to the laboratory worker in this country for the material which it contains. outside of the actual laboratory technique.

The material is well arranged, very well written and those sections which deal with the interpretation of the analyses should prove helpful.

The book takes up general chemical procedure, the analysis of water, sewage, soil, air, food and disinfectants. The bacteriology of these subjects is not dealt with in more than a cursory manner.

The illustrations add but little to the value of the book.

E. G. Birge.

Water Supplies, Their Purification, Filtration and Sterilization. *By Samuel Rideal, D. Sc. (Lond.) Fellow of University College, London; Fellow of the Institute of Chemistry, Public Analyst for the Metropolitan Borough of Chelsea; and Eric K. Rideal, B. A. (Cantab.), Ph. D. (Bonn). With numerous illustrations and tables. 274 pages. New York., D. Appleton & Co. $2.50 net.*

In this book the Rideals have brought together a large amount of useful information compiled from many sources and the results of an extensive first-hand experience with water supply problems. While the book deals primarily with purification, it discusses the natural and artificial impurities of water, sources of water, distribution systems, storage, and analytical methods. The sections on purification proper include chapters on preliminary purification, sand filtration, mechanical filtration, softening, chemical sterilization and electrical sterilization.

Dr. Rideal is a strong advocate of sterilization processes. He deals at some length with the deficiencies of other methods of purification, and cost limitations of ideal purity, and finds that the time has now come, owing to improvements terilization processes, for higher standards. He believes that it is impracticable to control upland sources and unsafe to rely wholly upon storage. Water filters have on many occasions failed to prevent epidemics. "There is no safe method of preventing water-borne diseases except sterilization of the liquid." The discussion of sterilization processes is especially full and detailed, dealing with heat, cold, light and chemical agents. The excess lime method and the use of chlorine compounds are recommended. Under electrical methods there are described and illustrated treatment by electrolytic hypochlorite, by ozone, and by ultraviolet light. The value of the descriptions of these newer processes would have been much enhanced had the authors, who are well qualified to speak, ventured a more definite personal opinion of their respective merits.

The book is not without its defects, chief of which is the rather poor arrangement of much of the material, especially in the earlier chapters. The chapter on storage deals largely with aëration, while sedimentation is discussed both under storage and preliminary purification. Historical references to the Bible, Pliny and Banks (1795) are indiscriminately mixed in with discussions of modern treatment. Algæ are discussed in two separate chapters and pre-filters and scrubbers are discussed under sand filtration rather than under preliminary purification. The engineering formulæ for impounding reservoirs on page 69, et. seq., are too briefly treated and are confusing in the matter of units employed while certain other statements can only be attributed to too hasty reading of original sources. Among the latter stand out conspicuously the sentence on page 60: "It is noticed that if pollution once occurs in a water of this kind" (wells or springs) "the entering bacteria including pathogenic ones multiply with extraordinary rapidity," . . . and on page 156: "In localities where the water supply has been sterilized many diseases which are not usually attributed to water contamination have materially decreased showing that the liquid may contain a number of harmful organisms besides those commonly recognized as disease germs." This last is evidently a misapprehension of the Mills-Reincke phenomenon which is described fully on the following page. Despite these minor faults the book is of value as a compilation of material and of the authors' experience.

Earle B. Phelps, Washington, D. C.

PERSONAL NOTES.

Dr. B. E. Washburn, who has been health officer of Nash County, N. C., has accepted a position with the International Health Commission and will take up hookworm work in Trinidad. Dr. W. H. Kibler has succeeded Dr. Washburn as full time health officer of Nash County.

The following persons have been elected members of the American Public Health Association since the Jacksonville meeting.

Dr. Frank G. Stroud, Moorestown, N. J.

Dr. Wm. C. Tucker, New York City.

Mr. Redfield Proctor, Proctor, Vt.

Dr. Wallace A. Manheimer, New York City.

Edwin E. Hutshing, Seattle, Wash.

Charles Strauss, New York City.

Agnes D. Randolph, Richmond, Va.

Dr. Paul Irving Carter, Port Townsend, Wash.

Dr. Erasmus Guy Hopkins, Glen Allen, Va.

Dr. James Obediah Fitzgerald, Richmond, Va.

DeMott C. Beach, Hammond, Ind.

Dr. Francis W. Anderson, South Bend, Wash.

Dr. Kenneth Dawson Graves, Richmond, Va.

Dr. Victor Safford, Boston, Mass.

George Wilbur Bakeman, Newton Upper Falls, Mass.

Dr. John A. Conway, Hornell, N. Y.

Dr. Halvor Holte, Crookston, Minn.

Watson Frank Walker, Detroit, Mich.

Edward F. McSweeney, Boston, Mass.

Raymond Daniel Gladding, Fall River, Mass.

John Richard Downes, Plainfield, N. J.

Dr. Pedro Malaret, Ponce, Porto Rico.

Dr. Daniel Hartman Kries, Melrose, Mass.

Dr. Edgar Madison Ledyard, Berkeley, Cal.

Dr. Hasson von Wedel, New York City.

Dr. Wilbur Fisk Thomas, Beaumont, Texas.

Dr. Millard Knowlton, Trenton, N. J.

Dr. Mather Humphrey Neill, Washington, D. C.

Dr. Thomas Wm. P. Flinn, Halifax, Canada.

Robert Newell Keimaird, Des Moines, Iowa.

P. Richard Jameson, Rochester, N. Y.

Dr. Ludvig Heekton, Chicago, Ill.

Dr. M. B. Floyd, Dayton, Ohio.

Wm. Francis Wild, Lincoln, Neb.

Hugo Oskar Altnow, Mandan, N. D.

Dr. A. H. Quessy, Fitchburg, Mass.

Dr. Harry Emerson Foster, Oakland, Cal.

Joseph Ignatius Murray, Winnipeg, Man.

Dr. Willis Walley, Jackson, Miss.

Elmer E. Harper, Kansas City, Mo.

Dr. Samuel Alvin Zimmerman, Valley City, N. D.

Dr. Robert A. Herring, New Orleans, La.

Dr. William Henry Marsh, Solomons, Md.

Frank H. Canaday, Boston, Mass.

Dr. Alexander Garcia, Philadelphia, Pa.

Robert E. Grandfield, Roslindale, Mass.

Clyde Fuller Smith, Chicago, Ill.

HEALTH DEPARTMENT REPORTS AND NOTES.

REPORTS.

Savannah, Georgia.

Dr. W. F. Brunner, health officer of the city of Savannah, presents the annual report of the Department of Public Health of Savannah for 1913 in its usual interesting form. Like other southern cities Savannah has to deal with the negro problem in planning the means to be used in the conservation of the public health and that it is a serious problem may be judged from the following table, compiled from some of the figures given:

	Population.	Birth-rate.	Death-rate.	Inf. mort. rate.	Still-births.
White	37,000	21.29	11.95	69	48
Colored	42,000	20.66	24.71	238	230
Total	79,000	20.88	18.98	157	278

It may readily be seen that not only do the poorer sanitary conditions among the negroes increase their death-rate, but also the colored population with higher contagious disease rate is a potential source of danger to the whites. Under such conditions a death-rate of 11.95 for the white population is creditably low but Doctor Brunner appreciates the fact that to insure safety the negro situation must be improved.

One of the great sanitary deficiencies is the inadequacy of the sewerage system, which has not been extended for fifteen years and leaves some of the thickly settled negro communities without sewers. The State Board of Health fails to assist in preventing the spread of communicable disease and Savannah receives many cases of smallpox which are shipped in on the train by other towns. For the safeguarding of the local population under such circumstances vaccination is being urged; it is estimated that 80 per cent. of the population is so safeguarded.

The report of Dr. V. H. Bassett, Bacteriologist and Librarian for the Department is unusually complete and tells not only of the number of laboratory examinations of various kinds but also describes the technique of the diagnostic methods, thus giving an additional general interest. Papers on The Detection of Added Water in Milk by Means of the Immersion Refractometer and on The Direct Diagnosis of Diphtheria by Bacterioscopic Methods, presented by Doctor Bassett and his assistant at the Georgia Association of Health Officials, are also printed in the report.

The report as a whole is thorough and up-to-date, though the use of an old-fashioned alphabetical system of classification of causes of death detracts from the general excellence.

Wilmington, Delaware.

Dr. Julian Adair, president, presents the annual report of the Board of Health for 1913. The president's report is very short, scarcely more than a letter of transmission for the reports made to him by the secretary, the treasurer and others.

The population is estimated at 93,500 in 1912, but this figure is used to calculate the death-rate for 1913, which is 14.38 as compared with 15.97 for 1912. This is a drop of 1.59 per 1000. The treasurer's report simply shows receipts and expenditures, the latter amounting to only $1,062.64. No information is given as to salaries or to the expense of the various activities of the board. There is much to be desired here and absolutely no means by which the work may be compared to that of other boards.

The following recommendations appear:

That there be provided a Municipal Hospital and a Laboratory;

That a pure food ordinance be prepared;

That there be provided medical inspection of schools;

That the Milk Inspector, Meat Inspector, and Vaccine Physicians be placed under the Health Department;

"A new garbage system, and that a new department be created having under its head both ash and garbage collections."

DEPARTMENT NOTES.

Health Side Show.

At the Indiana State Fair held in Indianapolis, September 7–12, 1914, one of the very popular tents was the "Health Side Show" which was run by the Indiana State Board of Health. The following account and illustration are taken from the *Monthly Bulletin* of the above board:

Health Side Show at Indiana State Fair.

"A large 'side-show tent' was procured and flaming advertising posters prepared. The cut shows the exterior of the tent pretty well hidden by the large painted banners in the style of the ordinary side show. The picture shows the Indianapolis News Newsboys' Band playing in front of the show to attract a crowd. Near the bass-drum will be seen the barker or ballyhoo, who, upon the cessation of the music, told the crowd in stentorian tones through a megaphone of the wonderful show the State Board of Health had to present, admission to which was 'free of charge for nothing.'

"In the interior of the tent was an exhibit of the State Board illustrating many phases of hygiene and disease prevention. The bacteriological and pathological laboratory had a booth where methods of examination were explained. Microscopes were at hand to show those who desired to know various microbes, and the placards within the booth made plain the processes and methods of the laboratory. The pure food and drug laboratory was represented in like manner, also the weights and measures department.

"By means of a recent invention it was possible to show still and moving pictures in daylight. Members of the staff of the State Board of Health were constantly on hand

and lectures went on continuously from ten in the morning until eight at night with only a slight intermission at noon. One audience followed another. It was estimated that 20,000 people passed through the tent in the four days of the fair. There was some hesitation on the part of the Board at first to adopt this method of promoting the public health cause, thinking perhaps the dignity of the cause would suffer. We now feel that no dignity was lost and that we know how to secure large audiences. Many thousand health circulars were distributed by a special distributing clerk near the door. From every point of view we found that the public health side show was a great success."

Virulent Smallpox in Tennessee.

Announcement was made in the January 29 issue of the *Public Health Reports* that a very virulent form of smallpox has been epidemic in the city of Chattanooga, Tennessee, since November. The first case came originally from El Paso, Texas, and died soon after arrival in Chattanooga on November 9. The total number of cases originating from and including the first up to January 15, has been 56; the number of deaths, 16. Surgeon Creel of the United States Public Health Service has officially reported that the epidemic is one of smallpox and not of plague, as had been rumored. Practically all of the fatal cases have been of the hemorrhagic form. Probably more than 15,000 people out of the population of 57,000 have been vaccinated since the beginning of the outbreak.

Gets Full Limit.

Although the city of New York has succeeded in securing 99 per cent. registration of births, persistent willful neglect to register births is not excused or tolerated in any way. One physician was fined the full limit of the law recently and had to pay $100 for failure to turn in a birth.

The weekly health bulletin tells of the trial in the following manner:

"After a lengthy trial, the court said (addressing defendant's counsel): 'I have allowed you to go into all those facts concerning the doctor's inability to file the certificate for the sake of seeing whether there was any possible defense, but I do not see any. Judgment for plaintiff to the amount of $100.'"

Public Hall Ventilation.

The weekly bulletin of the Cincinnati Board of Health recently called attention in the following way to the ventilation of a hall or room in which a meeting was being held:

"Last Friday afternoon, a number of men interested in philanthropic work attended a business session lasting for an hour and three quarters.

"The room in which the meeting was held was overheated and improperly ventilated. Three of the men showed the effects of a polluted atmosphere at the time, it being almost impossible for them to keep awake. At the time of writing this report, five of those attending the meeting had been interviewed by 'phone. Two of them have developed acute colds in the head since the meeting. . . . Both men attacked showed the effect of the bad atmospheric condition at the time of exposure."

It is a fact attested to by many ventilating experts that many of the public meetings held by societies and organizations of the highest character take place under conditions which are almost unbearable so far as ventilation is concerned. The tabulated result of the meeting referred to above undoubtedly is typical except perhaps in extent. The *Bulletin* stated that "the above history will repeat itself many times between now and the late spring, with an infinite variety of stage settings. At any rate, efforts spent in the proper utilization of ventilation appliances in public halls are very fruitful in the decrease in the morbidity rates of 'common colds.'"

State Laboratory Work.

The following statistics compiled by the Director of the Mississippi State Board of Health Laboratory, in an effort to determine the comparative standing of his own laboratory with those of other states, are very interesting.

The average amount of money spent for laboratory salaries in the thirty-two states was $5,080, with an average of 4.6 employees against $3,090 for Mississippi, which had two employees.

The number of examinations made by the Mississippi Laboratory for the year 1913 was 9,024. This was 1,243 more than the average of 7,781 for the thirty-two states. The greatest number of examinations reported by any laboratory for that year was that of Indiana, 25,372. The lowest number of examinations was that of 1,200 for Nebraska, with 2 employees.

The number of states making the different kinds of examinations are as follows: Tubercle bacilli 29, Widals 28, Malaria 19 (South Dakota makes a charge for this work), Diphtheria 27, Wasserman is done by 9 states (a charge for this work is made by Alabama, Idaho, Oregon and South Dakota) Anthrax 9, Gonorrhoea 18 (Alabama makes a charge for this work), Intestinal parasites 13, Rabies 18, Milk 15 (South Dakota makes a charge for milk work) Blood examinations are done by 7 states (a charge for same by the following states: Alabama and South Dakota), Meningitis 9, Gastric analysis by 5, (Alabama and South Dakota making a charge for this work), Pure food work is done by the laboratories of the state boards of health in 7 states. Tissues are examined in 9 (Alabama and South Dakota making a charge for tissue work). Urine is examined chemically by 11, and microscopically by 10, Nebraska being the only state that examined urine that does not make microscopical analysis. A charge is made for both chemical and microscopical examinations of urine by Alabama and South Dakota.

Hospital for Venereal Diseases.

Buffalo, N. Y., is to be the first city in the country to have a special building in charge of its Department of Health devoted exclusively to Urology according to an announcement in the *Buffalo Sanitary Bulletin*. Cases of kidney and bladder diseases and the usual venereal afflictions will be treated. There will be maintained an out-patient department, also, complete facilities for the administration of "606." Dr. Thos. B. Carpenter with an attendant staff will be in charge of the work but private physicians will be allowed to commit cases to the care of the hospital.

A Tuberculosis Investigation.

A current issue of the *Public Health Reports* gives a valuable and interesting report of a survey made by the Minnesota State Board of Health involving a study of the spread of tuberculosis. The figures, taken in connection with the study, serve to emphasize the need and value of proper education as the nature and habits of the tubercle bacilli, how the germs are transmitted and the proper care of those afflicted with this disease.

As a basis for the studies made a list was compiled of all those who had died of tuberculosis in each of the five counties during the year 1911 and up to August 1st, 1912. Then the surviving members of each family were looked up, and in all cases where consent could be obtained each individual was given a careful physical examination and tabulated data were prepared. As a result of the studies the infected persons were grouped as follows: 1, complete exposure; 2, partial exposure; 3, doubtful exposure. Under this classification it was found that in all the groups exposed to the pulmonary type of the disease, 70 per cent. of the members showed signs of infection, and in the non-pulmonary group, 32 per cent.

Of those classed as complete exposures, 74 per cent. under 16 years of age and 81 per cent. of those over 16 showed evidence of infection. Of those partially exposed, 18 per cent. under 16 years and 32 per cent. of those over 16 years of age showed evidence of infection. In the doubtful exposure group none under 16, and only 13 per cent. of those over 16 years of age, showed evidence of infection.

Fresh Air Theaters.

The good work which the Chicago Health Department has done in fighting for better ventilation in the theaters of that city is noteworthy. On January 1, 1913, out of 630 theaters in Chicago only 45 complied with the law so far as ventilation was concerned. On January 1, 1915, the number of ventilation law violaters had been reduced to 17.

Poisonous Fly Paper.

"There is a surprisingly large number of cases of poisoning of children from one to six years old from the use of arsenical fly poisons. Formerly blotting paper soaked with arsenic was much used. A little piece of this was put in an open saucer with some water and a little sugar. More recently shallow boxes of tin with a wick through the top have come into use, but on account of the habit of children of putting everything to their lips these seem to be as dangerous as the open saucer of poisoned water. In South Africa the authorities have forbidden the sale, except by licensed chemists, of certain arsenical fly destroyers, particularly the tin boxes which have a wick or wicks through which the poison is drawn. The fact that sugar is added to draw the flies makes these boxes especially dangerous to young children.

"From the first of July to October 15 the press of a few states reported forty-five cases of poisoning of children from the use of fly poisons, nine resulting fatally within a few hours. In a number of cases the child at the time the report was made was still very sick. In other cases the child was reported as having fully recovered. The reports cover only a few states, so are incomplete. Some cases of poisoning from the use of fly poisons are doubtless never reported, for it is difficult, perhaps impossible, for even an experienced physician to distinguish a case of arsenical poisoning from cholera infantum, the symptoms being so similar. How many children have been poisoned from these fly poisons and the deaths ascribed to cholera infantum can never be known. The cases reported are all children from slightly less than a year old to six or seven years old. In many cases these children are not old enough to tell what they have taken if questioned about their illness, and unless seen taking the poison the chances are that the cause of the child's illness will never be known and it will be thought the child had cholera infantum. The danger is especially great to the children of the foreign-born for as is well known many of the foreigners are slow to call medical aid in case of children's ailments. In country districts, where it often takes several hours to get a physician, it is especially dangerous to use fly poisons.

"These fly poisons are often exposed on the window sill because flies are attracted to the light. Babies also are attracted by the light and the window sill being in reach is therefore the most dangerous place to expose poisonous fly destroyers of any kind.

"There are as efficient and more sanitary ways of catching or killing flies, and fly poisons if used at all should not be used in any home where there are children or where children may visit.

"We have copies of these newspaper clippings on file and will be glad to exhibit them to any one interested.

"Certainly in our propagandas for health conservation, child betterment and educational movements this peril should be recognized and a warning be issued so that the coming summer does not witness a repetition of these fatalities and accidents that are wholly preventable. Arsenical fly destroying devices are as dangerous as the phosphorous match. They should be abolished."

Editorial, *Journal of the Michigan State Medical Society*, December, 1914.

New Stable Work in New York City.

The Health Department of New York City has taken a very bold step forward in its effort to suppress the fly nuisance. The December 5th bulletin of the Department contains the following:

"In order better to control the fly nuisance, the Department requested the Bureau of Municipal Research to make a study of stable conditions in New York City and submit a report embodying recommendations. In accordance with this request, and after making a survey the Bureau submitted the following:

1. That a complete census of all stables in the city be taken at once, either by Police Department or by sanitary policemen attached to the Health Department and special men detailed for this work.

2. That a thorough inspection be made twice a year.

3. That each inspector be required to inspect ten stables a day on original inspection.

4. That the city be divided into small districts after the census is taken, and that a large force of regular or special inspectors be assigned to the work so that it may be completed during the present summer.

5. That the Health Department require all manure to be sprayed with iron sulphate solution when collected from stalls and that disinfectants be used in stalls.

6. That manure be kept covered and removed at least every other day.

7. That boxes, barrels or other receptacles for manure be disinfected with lime or other effective disinfectant when emptied.

8. That stables not complying with these rules be refused a license.

"As far as practicable these recommendations were acted on by the Department of Health. In accordance with recommendation 1, a census was taken of the stables throughout the city. The sanitary conditions disclosed are conveniently presented in the following table:

Summary of Stable Census Work.

Completed census	* 11,080
Total number of horses	110,144
Stables containing—	
1–10 horses	8,266
11–25 horses	1,297
26–50 horses	634
Over 50 horses	415
Number inspected	*10,612
No cause for action	5,749
Nuisance abated by personal effort	160
Notice or order issued	4,593
Referred to other departments	110
Manure removed daily	3,813
Nuisance found due to—	
Fly-breeding manure vault (prohibited)	947
Not properly pressed and screened	3,018
Dirty floors	2,596
Dirty walls	1,606
Not sewer or cesspool connected	1,537
Inadequate ventilation	34
Defective plumbing	1,092
Floors not graded	159

* 468 stables were found at census taking to be stables, but were vacated before inspection.

"Recommendations 2, 3 and 4 are being acted upon and reinspection work will begin April 1st next. As to recommendation 5, green vitriol is thought to be so corrosive as to make sodium colemanite or borax or lime a better agent. Recommendations 6 and 7 are covered by the new rules adopted, and recommendation 8, by the extension of the permit system to all stables, as originally recommended by the Director of the Bureau of Infectious Diseases.

"As a consequence of this work and that to be performed in sequence next spring, the Department confidently looks forward to a great reduction in the number of houseflies and hopes that this will favorably influence the infant mortality of next summer, as well as the prevalence of typhoid fever and infectious diseases generally."

Weekly Bulletin, December 5.

Morbidity Reports in Mississippi.

An energetic campaign to secure a full report of morbidity has been in operation in Mississippi during the past year and the results, as reported in the *Health Bulletin* of that state by Dr. E. H. Galloway, have been extremely gratifying. The coöperation of every county health officer in an attempt to obtain morbidity reports from all of the physicians in each county, has been secured. For the month of September twenty-seven counties were in Class A, or in other words had secured reports from all of their physicians. Forty-five counties have been in Class A at least once. That the statistics which Mississippi is getting will prove of great value, is easily seen from the following:

During the first nine months, 4,283 cases of typhoid were reported, 87,174 cases of malaria, 899 of smallpox, 17,523 of measles, 225 of scarlet fever, 504 diphtheria, 883 Amebic dysentery, 2,015 chickenpox, 63 rabies, 9,019 pellagra, 6,019 tuberculosis (all forms), 1,171 cancer, 50 epidemic cerebrospinal meningitis, 85 acute poliomyelitis, 5,617 pneumonia, 3,285 hookworm disease making a total of 145,446 cases reported.

Medical Inspection of Food Handlers.

New rulings of the Pennsylvania State Department of Health include those with reference to medical certificates for employees of public eating houses; prohibiting the exhibition on the sidewalk of vegetables or other articles of food to be eaten uncooked unless they are properly protected from flies and upon a stand elevated two feet above the surface: and additions to the list of reportable diseases.

All cooks. waitresses, chambermaids in hotels, restaurants and other public eating places will be obliged to have certificates from the local boards of health, setting forth that they are free from contagious or communicable diseases.

Why Fumigate?

The New York City Health Department has given up fumigation after cases of infectious disease, as a costly procedure, the inutility of which has been well established. In reply to the query of a New York State physician, as to the "why" of the action, Commissioner S. S. Goldwater stated that the Department was willing to "profit by the lessons of experience and prepared to go forward even at the risk of being misunderstood for a time by the laity and by those members of the medical profession who are content to practice according to formulas which were valid a generation ago but which should now be supplanted by more enlightened views."

He said that it was "disconcerting to read that health officers lack the courage to discontinue practices which they publicly confess as valueless," and asked whether it was not the duty of the department to the taxpayers to discontinue the practice.

Governor Whitman on Health and Politics.

"Many persons have wished to lay before me particular matters relating to the detailed work or organization of the state charitable institutions, state hospitals for the insane, state health department, and other departments of kindred nature. I would like to say to all such that these matters lie within the discretion and public duty of the heads of these departments. I do not wish that departmental authorities should delay their work in order to consult me about details. I shall expect heads of departments to perform the duties for which they have been appointed and shall hold them responsible. If politics has crept into any of these departments, I expect the departmental authorities to eliminate it and to keep these social welfare activities free from political entanglements. Politics does not mix well with health and charity."

Charles S. Whitman.

State Charities Aid Association News, New York City, January, 1915.

Overcrowded Street-Cars.

The New York City Health Department has taken a stand against the spreading of disease through overcrowded street-cars.

The wilful overcrowding of passenger cars is a serious offense against public health and safety. It is the prevailing public impression that the railroad companies are not actuated solely or sufficiently by the desire to give the best possible service to the people of the city, and that cars are deliberately overcrowded for profit, at times when such overcrowding is unnecessary and avoidable. It can readily be demonstrated that diseases of the respiratory tract and other forms of communicable disease may be and are transmitted from person to person under conditions which commonly exist in subway and other passenger cars in this city. Are the transportation companies doing all that can reasonably be expected of them to minimize the danger? This pertinent question is raised in the following communication addressed to the Public Service Commission by the Commissioner of Health on December 1st:

"December 1, 1914.

"*Public Service Commission.* 154 Nassau Street, City:

"Gentlemen—At a recent conference on street car sanitation, it was the consensus of opinion of those present that while some importance attaches to the cleaning of passenger cars, their overcrowding is a matter of infinitely greater significance from the standpoint of public health. This Department is entrusted with the supervision of health matters in this city and therefore the question of car sanitation is one which the Department may not properly ignore; and yet any improvement of existing conditions must be brought about either through the voluntary acts of the transportation companies, or through the enforcement of standards prescribed by your Commission.

"It is our belief that the vitality of passengers who ride in overcrowded and poorly ventilated cars is injuriously affected; and that the breathing, coughing and sneezing of persons who are packed together results in the transmission of disease by means of so-called 'droplet' infection.

"Presumably some relief may be looked for on the completion of the new subways. In the meantime, are the companies doing all that they can reasonably be expected to do, to protect the health of their patrons? If, as I have been informed, the companies do not use all of their available rolling stock, but place on the rails only a sufficient number of cars to carry their passengers under conditions of maximum overcrowding, they are, to my mind, culpable of a serious offense.

"In other cities, regulations have been adopted and are enforced which limit the number of passengers in cars. May I ask whether any similar regulations have been adopted by your Commission, and what efforts, if any, are made to enforce them?

"Although the improvement of existing conditions in this important field can only be effected either by the companies or through the activities of your Commission, many citizens decline to absolve the Department of Health from blame for existing conditions, and I feel that efforts should be made by us at least to place before the citizens of the city the facts as they exist. The harm which is being done is very serious, and every possible effort should be made to obviate it.

"Awaiting the favor of your reply, I am, very truly yours,

"S. S. Goldwater, *Commissioner*."

Weekly Bulletin, December 12.

Farmers Being Paid for Milk on Score-Card Basis.

"For the past year or two the larger companies selling milk in New York City have purchased milk from dairy farmers on the score-card basis. In general the contract provides for a premium of ten cents per hundredweight for a score above 68, particular attention being given to methods of operation. That this is an effective incentive to the dairy farmer to produce milk according to modern standards is not open to question.

"In this connection it may not be amiss to quote the following paragraph from an address delivered by Supervising Inspector Russel Sturgis at the New York State Dairymen's Convention, December 15, 1909.

"'As a means of correcting this wrong [dirty handling] and as an inducement for further efforts towards the adoption of cleanly methods, I will suggest that milk be purchased on a score-card basis, for I am confident that as soon as producer and dealer are assured of the honesty of the scoring method and the integrity of the scorer, they will agree with me.'

"Curious as it may now seem, the suggestion then made was considered entirely impracticable!"

Weekly Bulletin, City of New York, Department of Health.

Public Lectures for Health Department Employees.

A course of lectures on matters relating to public health has been arranged by the Bureau of Public Health Education of the Department of Health of the City of New York for the benefit of the various inspectors and nurses employed by the department, in order to keep them informed concerning the activities of the different bureaus, and also to render them familiar with progress in medical and sanitary science. The lectures will therefore constitute a sort of school of sanitary science. Although attendance is not compulsory, employees are expected to be prepared, when the course ends, to pass an examination on the subjects discussed.

PUBLIC HEALTH NOTES.

Twenty Millions for Tuberculosis.

The National Association for the Study and Prevention of Tuberculosis has just announced some very interesting facts concerning the anti-tuberculosis work for the year just passed.

"More than $20,500,000 was spent last year in the campaign against tuberculosis in the United States. Of this sum, 66.8 per cent was derived from public funds, either federal, state, county or municipal, and the remainder was contributed by private philanthropy.

"New York State spent more money last year in the tuberculosis campaign than any other two states in the Union, due largely to the increased and rapidly developing movement for city and county care of the tuberculous. Pennsylvania, which has occupied second place for the past four years, was superseded last year by Illinois, with Massachusetts in fourth place and Colorado in fifth place. The following table shows the estimated public and private expenditures in each of the five leading states."

Expenditures in 1914.

State.	Public.	Private.	Total.
New York	$3,286,858	$1,728,269	$5,015,127
Illinois. . .	1,789,428	536,100	2,325,528
Pennsylvania . .	1,637,623	473,913	2,111,536
Massachusetts. . .	1,231,600	301,767	1,533,367
Colorado .	100,500	737,798	838,298

Sewage Disinfection.

The desirability of the disinfection of the sewage from vessels, especially in the fresh water lanes of the Great Lakes, and from trains, and the suggestion by Prof. E. B. Phelps that steam might be used in the case of steamers and railway coaches has led to the designing by L. C. Franck of the United States Public Health Service of a device that will perform this function automatically. The efficiency of the device has been tested in the Hygienic Laboratory at Washington and a high germicidal effect demonstrated. The cost of installation in a railway coach or steamer will be very reasonable and the cost of operation will be very low indeed.

A detailed description of the apparatus and its operation will be found in the *Public Health Report* for January 1, 1915.

Avian Tuberculosis in Man.

A case of cutaneous tuberculosis in which the lesions, the chronicity of the disease and the results of the microscopical examination were in exact agreement with leprosy and which was caused by the organism of avian tuberculosis was reported in June by Doctor Lipschütz of Vienna in a paper which is reviewed by George W. McCoy, Surgeon, United States Public Health Service in Vol. 30, No. 1 of the *Public Health Reports.*

The chief significance of the discovery is that "the presence of large numbers of acid-fast and alcohol-fast bacilli may be found in a disease other than leprosy."

Successful Referenda on County Tuberculosis Hospitals.

Another string of victories has been added to those which have already been won in popular referenda for tuberculosis hospitals, in the votes taken in the New York counties of Chenango, Lewis, Nassau, and Suffolk on November 3. The form of the question was such that the vote at the polls actually makes the appropriation and it is mandatory upon the county authorities to proceed at once to the selection of sites and erection of buildings. The success achieved was the result of vigorous campaigns of publicity and persuasion carried on by the State Charities Aid Association with the coöperation of the State Health Department, the Metropolitan Life Insurance Company, and private volunteers. "These hospital campaigns," writes Mr. George J. Nelbach in detailing the methods and results in the *Journal of the Outdoor Life* for December, "show that, if once the question of hospital provision for tuberculosis cases is put up fairly and squarely to the people, and vigorous popular educational measures are taken to bring the matter to their attention in an effort to explain the facts, an affirmative result may be expected. There is a distinct advantage in securing hospitals through this method, in that the campaign for their provision creates toward the new institution a sympathetic attitude which cannot fail to be of much value in promoting the welfare of the institutions from the very start." This stride in advance is part of the general movement in New York State to obtain adequate care for both early and advanced cases of tuberculosis in institutions situated conveniently near to the various communities. The problem is solved by the county hospitals, such as have already been established in twelve other counties of the state. Similar county hospital laws are now in effect in twelve other states.

Christian Science in the Senate.

"Among the bores of the United States Senate Senator Works is one of the most zealous and persevering. His own autobiography as a devout follower of Mrs. Eddy is now supplemented with a score of testimonials from other disciples who have been cured of sundry ailments and disorders, from broken arches to compound fractures, from crooked mouths to malignant tumors, from drunkenness to bone tuberculosis, from nervous exhaustion to locomotor ataxia. Letters in praise of Christian Science have been pouring in to the Senator from most of the states in the Union, pouring in unsolicited since first he made his confession of faith before the world. He might without difficulty give hundreds of cases of healing; 'but,' he explains, 'I cannot in justice to the Senate consume time by including the many cases, convincing in their character, that I could easily furnish.'

"Why should the time of the Senate be given over at all to testimonials of this sort? They are all to much the same effect: all are couched in the familiar terms of the grateful patient, and the great majority deal with miracles in cases where 'all hope of relief through medical practitioners had been abandoned after long and faithful trial.' Yet the Senator insists that he is not at all concerned 'to advertise Christian Science or to induce any one to accept or resort to it for relief.' His whole desire, it appears, is 'to show the cruel injustice and folly of legislating against it in favor of any other means of healing.'

"This pretext would be plausible enough if there were the slightest evidence of cruel injustice, or any examples of legislation against Christian Science. The fact is, however, that any one is at liberty to practise this method of treatment to his heart's content provided only that he comply with the laws that control all concerned in the healing art. These laws were designed for the protection of the public, not for the profit of the healers."

N. Y. Evening Sun, January 9, 1915.

Typhus and the Louse.

Clinical Medicine recently published an article by Dr. A. Rose emphasizing the fact that the body louse is known to be the carrier of the germ of typhus fever and calling attention to the scourge of lice from which soldiers have always suffered and its relation to the disease in question. The magazine makes a further comment upon an article by Nicolle in the "Comptes Rendus de L'Academie des Sciences" dealing with the louse as the carrier of typhus.

The discussion of this paper shows how Tunis has succeeded in ridding itself of the disease which has always been endemic there by simply resorting to the systematic destruction of all lice found upon the person and in the vicinity of patients suffering from the disease. In 1909 there were 1,836 cases of typhus and in 1912 only 22.

Grave fears are expressed of the possibility of an outbreak of typhus in the army during the present war. This danger is thought to be increased by the necessarily insanitary condition under which the troops in the trenches are placed and by the large number of lice said to be found in the trenches and on the bodies of prisoners.

Catching Cold.

It is true that our comparatively recent knowledge of "colds" which shows them to be of an infectious nature is likely to make us stop using the phrase "taking cold" and substituting the phrase "acquiring an infection." Dr. John C. Rommel, in the *Medical World*, made a healthful suggestion however that it is just as true now, as in the past, that undue exposure of the body to a sudden drop in temperature renders the individual liable to this malady. And we may well realize that hygienic measures which tend to "harden" the skin, such as treatment with cold water, cold air and the wearing of lighter clothing, now as in the past, render the individual immune. In our eagerness over the discovery of the biologic defenees we should not neglect the value of personal hygiene.

Clinical Medicine.

Antityphoid Vaccination.

The success of antityphoid vaccination has been well demonstrated during the present war. The *Presse Medicale* gives a report concerning the vaccination of 50,000 soldiers near Belfort, France. The injections were given on the posterior aspect of the shoulder and it was found possible for three surgeons to vaccinate as many as 1,000 men in an hour. Iodine was used as a local antiseptic and in not a single case were serious effects on the general system observed. Concerning the prophylactic value of the procedure it was found that the number of cases of typhoid fell from ten to one or two daily as the men in the district were vaccinated.

Public Health reports the condition of vaccinated and un-vaccinated soldiers in the British army. Summarizing results it was found that among 10,378 inoculated men, 56 cases of typhoid occurred, an incidence of 5.40 a 1,000; among 8,936 un-inoculated men there were 272 cases giving a rate of 30.4 which was more than five times as heavy. In some divisions of the army the case rate among un-inoculated troops was more than six times that among troops which had been inoculated. These figures seem conclusive in proving the value of antityphoid serum.

Influence of Heredity in the Incidence of Cancer.

Some recent advances in the study of cancer are reported by Dr. M. S. Fleisher in the *Interstate Medical Journal*. The author shows that conclusions from the study of heredity in its relation to cancer among humans are not now obtainable because of the fact that statistics which would yield positive results require many years for their accumulation. However, the fact that cancer is prevalent among some species of smaller animals, and especially among mice, has opened the possibility of practical investigation along this line.

The study of Jensen shows that among four or five hundred descendants of a cancerous female mouse not more than five developed tumors. Tyzzer shows that 50 per cent. of the descendants from cancer-free parents had tumors while among the offspring of cancerous parents 75 per cent. developed tumors. Concerning these last results two facts are to be noted. The author has taken into consideration many lesions which would not be considered as tumors by many investigators. Again the results may show merely that the larger incidence of tumors in the one family was due to their belonging to a susceptible strain rather than to an inherited liability to develop tumors.

Murray has gathered some statistics based upon the occurrence of cancer in female mice. He makes this distinction because, in the majority of cases, cancer occurs in the mammary glands and the disease is uncommon among the males. He finds that the cancer rate is high between the fifteenth and eighteenth month of life. This curve of cancer incidence in relation to the life period is similar to that noted in the human family for mammary cancer. Murray shows that of the offspring of the first or second generation from cancerous ancestors 10 per cent. had cancer while of those of cancer-free parents only 8.6 per cent. developed the disease. Again the question arises as to whether we have a distinction among individuals or a distinction among families.

Slye has shown that the incidence of cancer varies in different strains from 16 per cent. to nearly 100 per cent., while the experiments of Loeb show a variation in cancer incidence between 3⅓ per cent. and 82 per cent. The hybrids resulting from a cross between two different strains have not shown uniform results; nor when mice from non-cancerous families have been placed in company with cancerous mice have they shown a greater tendency to develop cancer.

The research along this line is far from complete but certain facts are suggested. Unquestionably, a certain pre-disposition to the development of cancer may be transmitted by heredity. But we have no evidence that the development of cancer in a parent means that the offspring are necessarily liable to cancer because it seems to be the history of the family rather than that of the individual which is the deciding factor. The crossing of a cancerous with a non-cancerous race has not yet yielded sufficient information for us to determine whether the tendency toward cancer is a dominant or recessive quality.

Facts and Suggestions Concerning Diphtheria.

The following comes from Dr. F. M. Meader of the New York Health Department.

"Last year there were 1,817 deaths out of 19,888 cases of diphtheria reported in the state of New York. From this number of deaths we would expect about 30,000 cases, so that it is probable that about every third case of diphtheria was not reported. It is hoped this year to secure a more complete registration of cases. We have compiled data on the deaths that are reported to us for each of the last four months.

Table Showing the Ages of Persons Dying of Diphtheria During August, September, October and November, 1914, in New York State (exclusive of New York City):

Age, Years.	No. of Deaths.	Age, Years.	No. of Deaths.
0	7	11	0
1	18	12	3
2	18	13	2
3	22	14	2
4	22	18	1
5	13	19	1
6	19	40	1
7	9	45	1
8	8	48	1
9	8		—
10	4	Total	160

"The important fact that appears is that only about 3 per cent. are among adults, and that 70 per cent. of the deaths *are children under seven years of age.*

"Attention of the physicians is therefore called to the importance of taking particular care of the young child. The following procedures are recommended:

"1st. When there is a baby or young child in the home of an adult ill with diphtheria, the child should be immediately isolated, cultures should be taken from the throat and nose of the child. If the culture should be negative, then he should be sent to live with adult friends or relatives during the illness of the patient.

"2d. If the child remains at home, when there is a case of diphtheria residing in the house, an immunizing dose of 1,200 units of diphtheria antitoxin should be given to all young children of fifty pounds weight, 500 units to all babies of twenty pounds or less.

"3d. To every child of fifty pounds who has the least suspicion of diphtheria a dose of 2,500 units should be given subcutaneously at once, before waiting to learn from the laboratory the report of the cultures. Twenty pound babies should receive about 1,000 units. It is best to err on the safe side—give the antitoxin early.

"4th. It is often difficult to secure a satisfactory culture from young children. If a report from the laboratory states that the culture is negative for diphtheria when clinical symptoms persist, take another culture.

"5th. If the child is very sick give the antitoxin intraveneously; 5,000 units given intraveneously is worth 20,000 units given subcutaneously.

"6th. Be sure that your health officer keeps a sufficient supply of fresh diphtheria antitoxin on hand, ready for instant use. The State Department of Health will supply him with all that he needs."

New York State Journal of Medicine.

Primary Nasal Dipththeria.

The experiences of Dr. H. A. Schatz, as outlined in the *New York Medical Journal,* indicate that nasal diphtheria in children is more common than generally supposed. One case of primary nasal diphtheria has been observed to about every six cases of the faucial type. Diagnosis in these cases was based upon the examination of cultures from a nasal discharge accompanied sooner or later by nose bleed. And the cases were found to clear readily after the administration of antitoxin. The author cites articles by Toler, Levinson, Graham and De Biehler bearing upon the prevalence of this disease among children. These cases develop faucial diphtheria usually when they do not receive prompt treatment and such cases are hard to combat. School medical inspectors have occasionally overlooked cases of nasal diphtheria and the author states that mothers should be instructed to bring to the physician every child presenting a nasal discharge that causes excoriation of the upper lip and nasal vestibule, crusting, and later nose bleed.

The von Ruck Treatment.

The United States Public Health Service has announced that the von Ruck tuberculosis vaccine does not fulfill the claims of its inventor, that the administration of the vaccine does not immunize guinea pigs from the disease, that, on the contrary, the animals are rendered even more susceptible, and finally that the vaccine is not stable, deteriorating with age. Though the investigation was begun in Dr. von Ruck's laboratory in Asheville, N. C., the work terminated there suddenly when the doctor refused to allow the government's representative to run an independent and uncontrolled investigation. The work was finished in the Hygienic Laboratory.

The Air of Railway Tunnels.

"The discomfort of travel through smoke-filled railway tunnels is well known, but the question as to the possible effect of the gaseous impurities on the public health has not received the attention which it deserves. The result of such a study has just been published by the Hygienic Laboratory of the United States Public Health Service. The relative amounts of sulphur dioxid and of carbon monoxid found under ordinary conditions in a typical non-electrified and a typical electrified tunnel (those of the Pennsylvania and the Baltimore and Ohio Railroads at Baltimore) were accurately determined. The results show that on an average there was about five times as much of the two gases in the tunnel through which coal-burning locomotives pass as in the one through which the trains are drawn by electric tractors. It was shown that the amounts of the gases in the non-electrified tunnel are subject to great variations, depending on traffic conditions. The probabilities are that a person will encounter noticeable amounts of sulphur dioxid in four cases out of five and disagreeable or very irritating amounts in two out of every five trips.

"The amounts of sulphur dioxid found in the non-electrified tunnel varied from 0.6 to 15.1 parts per million, and the corresponding figures for the electrified tunnel were from 0.3 to 2.9 parts per million. In the case of carbon monoxid the amounts in the non-electrified tunnel varied from 4 to 267 parts per million, and for the electrified tunnel, from 3 to 25 parts per million. In order to ascertain what effects these quantities might have on passengers passing through the tunnels, Seidell and Meserve reviewed the literature of studies which have so far been made of the action of these gases on animal organisms. It was found that results on minute amounts of the gases are quite meager and the statements concerning their action are in very general terms, so that no really satisfactory idea of the maximum amounts which can be tolerated without injury can be obtained. The question is naturally one which does not lend itself readily to solution. Individual variations and idiosyncrasies will play an important part in any studies which can be made, and interpretation of the results will vary with the point of view of the interested person.

"The principal value of the data contained in the bulletin of Seidell and Meserve is to show the actual amounts of the gases present and the reduction in the amounts which can be accomplished through electrification. The question as to whether or not the quantities present are dangerous to health, can be answered only on the basis of extensive physiologic experiments made with similar quantities of the gases. In regard to the discomforts of travel through smoke-filled tunnels there is no question. It does not appear possible at present, however, to affirm that the gaseous impurities in non-electrified railway tunnels are a menace to the public health and therefore justify a demand that the conditions be ameliorated. It seems likely that persons suffering from respiratory or circulatory disturbances may have the condition aggravated by passage through tunnels containing coal-gases, especially sulphur dioxid."

Journal of the American Medical Association, August 15, 1914.

The Sanitary Manufacture of Cigars.

"Under its sanitary code, the Department of Health of the City of Chicago supervises establishments in which cigars and cigarettes are manufactured. The Sanitary Code of San Francisco forbids the placing between the lips or in the mouth the ends of cigars in the process of manufacture, also spraying or moistening tobacco by means of water emitted from the mouth. The regulations of New York State govern to some extent the sanitary conditions of cigar factories. The only reference to the same in the New York code is the requirement that cuspidors be placed in cigar factories. There is no legal prohibition of the use of the old familiar process in hand manufacture, of wetting the finger tips with saliva, then dipping them in gum and applying the mixture of gum and saliva to the cigar tip. To a large extent cigars are now manufactured by machinery, which renders unnecessary the use of this filthy process. Undoubtedly, however, some cigars are made by hand. An investigation by inspectors of the Bureau of Infectious Diseases of fifty-eight cigar factories, stores, and homes where cigars are manufactured in New York, revealed but little insanitary practice. The workers all denied such use, but alleged that others were guilty. One worker was seen to bite off the ends of a cigar he was making. A report from the Research Laboratory of the Department of Health shows that pathogenic organisms remain viable on tobacco for some days, and disease could be transmitted from the mouth of the infected workman to a healthy smoker. This matter was also laid before the Committee on Infectious Diseases of the Advisory Council, whose opinion was that while the supervision of the cigar industry might not afford citizens much protection from communicable diseases, owing to the relatively limited manufacture of cigars in New York, it seemed advisable for the city of New York to take an advance step in the matter. A new section of the sanitary code regulating the process of manufacturing cigars is in preparation and will probably be shortly adopted by the board of health."

New York Medical Journal.

Alcohol and Germ Plasm.

Very interesting experimental light upon the effect of alcohol on male and female germ plasm is cited by Dr. J. E. Wallace Wallin in an article in *The Psychological Clinic* of October 15. Among other things he tells of some experiments on guinea-pigs. These results he sums up as follows:

"The results showed that 'an alcoholized male guinea-pig almost invariably begets defective offspring even when mated with a vigorous normal female,' and that the effects were nearly as bad on the second generation (Stockard). Of 103 full term matings 42 per cent. gave negative results or early abortions, 13.5 per cent. gave still-born litters, 45 per cent. resulted in living litters, containing 89 young of whom only 58 per cent. survived. On the other hand, the 35 control normal matings gave 94 per cent. of full term litters, about $\frac{1}{3}$ per cent. of still-born litters, 91.5 per cent. of living litters, containing 60 young of whom 93 per cent. survived. The proportion of alcohol in the testes and in the ovary compared with the proportion in the blood has been found to be as 2 to 3 and 3 to 5, respectively (Nicloux and Renaut). Alcohol, therefore, apparently can act deleteriously directly on the spermatozoa and eggs before or during the period of impregnation."

INDUSTRIAL HYGIENE AND SANITATION.

To Fight Tuberculosis Among Workingmen.

The National Association for the Study and Prevention of Tuberculosis has inaugurated a new campaign for closer coöperation with labor unions and other groups of workingmen.

A committee has been appointed with Dr. Theodore B. Sachs, President of the Chicago Tuberculosis Institute, as chairman, to formulate plans for immediate and future action. Other members of the committee are Mr. Samuel Gompers, President of the American Federation of Labor, of Washington; Mr. George W. Perkins, Secretary of the International Cigarmakers' Union, of Chicago; Mr. John Mitchell, of the New York State Compensation Commission, of New York; Mr. Austin B. Garretson, President of the Brotherhood of Railway Conductors, of Cedar Rapids, Iowa; Dr. William Charles White, Medical Director of the Tuberculosis League of Pittsburgh, and Dr. David R. Lyman, Superintendent of the Gaylord Farm Sanatorium, of Wallingford, Conn.

As the first step in the campaign, a special health bulletin has been prepared for the labor papers, and will be sent out monthly in coöperation with the members of the International Labor Press Association. These bulletins will contain articles of interest relative to the coöperation of labor unions in the anti-tuberculosis and public health movements; notes concerning the prevalence and prevention of certain diseases, especially those of an industrial character; and suggestions on personal and community health.

A second step in the plan is an investigation into the various special experiments of coöperation between workingmen and the anti-tuberculosis movement that has been carried on in this country. Such work as that of the tuberculosis relief associations in Hartford, New Haven, Meriden and other Connecticut cities; the Trades Union Sections of the Buffalo and Newark Anti-Tuberculosis Associations; the work of the Factory Committee of the Chicago Tuberculosis Institute; the Tuberculosis Pavilion of the Albany Federation of Labor; the so-called "Overlook Plan" of Massachusetts; and other similar efforts will be studied and reported upon. These reports will be made the basis for recommendations and further study in industrial communities throughout the country.

As a result of the approach of The National Association for the Study and Prevention of Tuberculosis to the American Federation of Labor, a resolution (No. 51) was adopted by that body at its recent Philadelphia meeting endorsing the educational work of the Association and calling upon all officers and unions to help in promoting this work. The International Typographical Union adopted a similar resolution (No. 76).

Canning Progress.

Great improvement in the sanitation of Indiana canneries has been attained during the year just passed. Conditions as they existed in 1913 were called to the attention of the State Health Department and in the fall of the year, the following notice was served on canners and packers:

"All factories in which fruit and vegetables are prepared or packed for human consumption shall be provided with modern toilets, technically known as 'closet combinations,' operated by water under pressure and connected to a sewer and properly trapped.

"Sinks supplied with water under pressure shall be provided adjacent to such toilets at which all employees shall be compelled to wash their hands after visiting toilets.

"Soap and clean towels shall be provided in sufficient quantity

"Sanitary drinking fountains supplied with pure drinking water shall be provided for the use of operatives. The use of water buckets and dippers is forbidden."

Every means was employed by the Board to help canners by way of suggestion and coöperation and the result has been most encouraging. In most of the instances where the regulations were not complied with during the 1914 season, there are assurances that the necessary changes will be made before next season opens.

The Board has calmly announced that those canners who have made absolutely no attempt to conform to regulations, will not operate next season.

Industrial Sanitary Standard.

To any one who is familiar with the difficulties arising from the various sanitary standards to be found in the different states and the difficulty of enforcing indefinite laws which provide for "adequate exits, suitable ventilation, proper light, sufficient toilet accommodations, etc.," the need of workable standards is apparent. The lack of these standards has arisen from ignoring the human factor in industry. Legislation along these lines must be cumbersome at best and the proper place for the setting up of these standards is within the industries themselves. Industry must realize the relationship between industrial efficiency and industrial justice, the rights of the workers and of the general public in industrial control, and that democracy is the proper basis for industrial as well as political government. For nearly thirty years the trade associations of Germany have been governed by rules of their own making with excellent results. The textile industry in England has set up a standard of safety and sanitation. The Industrial Commission of Wisconsin has undertaken to free industry from legislative control and the organization of the National Council for Industrial Safety marks a step towards industrial regulation in these matters.

"The solution of the problem of the establishment of industrial sanitary standards, the solution of the labor law enforcement, and the solution of the labor problem itself, lies in industrial self-control and industrial democracy."

Dr. G. M. Price, in the *New York Medical Journal,* December 26.

Lead Poisoning Reduced.

The success of the English Public Health Service in combating lead poisoning may be seen from the following quotation taken from *The Medical Officer.*

"That the efforts of the Home Office have not been unavailing is well shown in a recent memorandum issued by the factory department, from which it appears that in 1900 there were reported to the department *1,058* cases of industrial lead poisoning, while in 1913 this number had been reduced to *535.* A very remarkable reduction occurred in the white-lead industry, the number of cases reported in 1900 being 358, and in 1913 only 29. In the potting trade the reduction was from 200 to 62. In the coach building and allied industries little improvement has taken place, the number of cases occurring in each of the two years being about 70. This is no doubt to be accounted for by the great difficulty there is in clearing away the fine dust when men are engaged in painting and polishing the bodies of carriages; moreover, they have to work very close to the material used."

Industrial Accidents.

The Industrial Accident Board of Massachusetts at the end of its first year reports the total number of non-fatal accidents in the state as 89,694, or about one for every ten wage-earners. The board believes that at least half of these can be prevented by improved inspection methods, by safeguarding machines before they leave the factory, by the maintenance of safety museums, through lectures, moving pictures, school talks and the elimination of danger spots in plants. Of the 474 fatal accidents reported, approximately one-quarter were caused by railway equipment.

Employer Must Warn Employees.

Judge Orlady, of the Superior Court of Pennsylvania, has ruled that it is the duty of an employer to warn employees of any hidden dangers in connection with their work.

The ruling, according to the *Weekly News Letters* of the American Federation of Labor, was given in sustaining a judgment of $2,100 obtained by an employee of the India Refining Company of Philadelphia, whose work was mending worn and torn canvas strainers through which oil had passed. The ends of her fingers became very sore and inflammed, and one was so badly infected that it had to be amputated.

Judge Orlady said:

"When an inexperienced employee is placed in charge of dangerous work it is the positive duty of the employer to instruct and properly qualify him for such service and to warn him of such dangers as are not apparent."

Organization for "Safety."

The July issue of the *Monthly Bulletin* of the Pennsylvania Department of Labor and Industry contains the following suggestions for the organization of a department of safety:

"In any form of organization created, the following elements are essential:

1. A Safety Inspector (who in a small plant may perform other duties). He should,

(a) Inspect—(1) For need of safeguards; (2) For installation of safeguards; (3) For maintenance of safeguards; (4) For use of safeguards; (5) For unsafe practices; (6) For plant cleanliness;

(b) Have charge of details of all safety work;

(c) Receive all reports, recommendations and suggestions;

(d) Keep all necessary records.

2. A Central Committee of Safety composed of plant superintendent or his assistant (chairman), safety inspector (secretary), and three or more high grade department superintendents, foremen or workmen, which should,

(a) Have general charge and supervision over safety work;

(b) Pass on all controverted matters;

(c) Gather all available information;

(d) Establish standards for safeguards;

(e) Promulgate rules for safe operation;

(f) Outline education campaign.

3. Workmen's Committees; consisting of three to five workmen, appointed and changed periodically.

They should,

(a) Make inspections;

(b) Investigate accidents in their several departments;

(c) Render written reports on forms provided for that purpose.

4. Foremen; each foreman should,

(a) Enforce safety rules adopted;

(b) Be held responsible for the safety of his men;

(c) Investigate accidents, reporting causes, and suggestions for method of preventing recurrence, on forms provided for that purpose;

(d) Make frequent inspections of his department;

(e) Render weekly written reports on forms provided for that purpose.

5. Meetings of foremen—held monthly to discuss safety matters.

6. Workmen; Each workman should be educated and interested in Safety Matters. This work involves,

(a) Instruction of new men;

(b) Familiarizing of men with rules;

(c) Interesting the men through bulletin boards, prizes, etc.;

(d) Discipline."

Mortality Among Cotton Operatives.

The boy who works in a cotton mill has only half as good a chance to live to be twenty years old as the boy outside the cotton mill, and there are over 40,000 child operatives in the cotton mills today.

Relatively more girl operatives than boy operatives die under 20.

Tuberculosis heads the list of the causes of death and the fact that operatives almost without exception in each locality and in the various sex, race and age groups show an undue proportion of deaths from tuberculosis is almost conclusive proof of a causal connection between operative work and the disease.

The work is done under conditions which undoubtedly have their effect on the tuberculosis death-rate. The atmosphere in the mills is always kept humid because the threads will break if the air is dry. The amount of moisture necessary is not harmful, but as it is extremely difficult to regulate the amount, an excess is usually present.

The general lack of dressing rooms where street clothes can be kept dry, makes this excess even more dangerous. Street clothes must be hung in the moist rooms, and are exceedingly damp when the workers put them on at the close of the day.

The respiratory diseases other than tuberculosis come next to it in importance, followed by such diseases as nephritis and diseases of the digestive tract. In every case the operative death-rate exceeds the non-operative.

The universally higher death rate between cotton operatives and other factory workers, and the greater prevalence of tuberculosis among cotton workers combined with the fact that the cotton industry employs many more children under 16 than any other industry in the United States, lend to the industry a sinister distinction.

Child Labor Bulletin, November, 1914.

Industrial Home Work in Massachusetts.

The Bureau of Statistics of Massachusetts in coöperation with the Woman's Educational and Industrial Union has recently issued a bulletin showing the results of an inquiry made by them for the purpose of obtaining information relative to the extent of "home work," so called, in Massachusetts.

The subject was approached, with the object in view of ascertaining facts and conditions in their relation to:

1. The Workers.
2. The Industries.
3. The Public.

The principal outstanding facts seen as a result of this inquiry are as folllows:

1. A low average of wages generally prevails for home work.
2. There is little competition between factory and home workers.
3. Employment in home work is shown to be very irregular.
4. A conspicuous evil found was that of child labor.
5. Married women formed nearly three-fifths of the total number of home workers 16 years of age and over.
6. Living conditions in the homes visited were found to be generally good, although numerous instances of overcrowding were discovered.
7. Home work is not confined to the congested tenement districts.

Metal-Mine Accidents During 1913.

The death-rate in the metal mines of the United States in 1913 shows a gratifying decrease from the record of 1912, the total number killed, as reported by the various operators, being 683, as compared with 661 in 1912 and 695 in the preceding year. The number of men employed during 1913 was 193,088, as compared with 169,199 in 1912. The fatality rate was therefore 3.54 per 1,000 men employed, as against 3.91 per 1,000 for 1912 and 4.19 for 1911.

Although the total number of persons killed in the metal mines during 1913 was slightly more than in 1912, yet there were about 24,000 more men employed, so that the fatality rate is reduced to 3.54 per 1,000 employed during 1913, as compared with 3.91 for 1912. A number of the states show a slight increase, but a majority of the principal mining states show marked decreases.

This gradual reduction is to be accounted for largely by the introduction of safety appliances, better supervision and a stricter enforcement of rules and regulations, and a closer observance of the state laws. Practically all of the larger companies, and many of the smaller ones, have done much in safeguarding their employees, and have helped to spread the "Safety First" movement. By first-aid treatment many slight injuries were properly dressed, so that pain was relieved and a cure effected in a short time, with the added result that many minor injuries were kept from becoming serious or fatal.

Coke-Oven Accidents During 1913.

The hazard of the coke industry compares favorably with the quarry industry and the surface workings of metal mines as shown by figures collected by Albert H. Fay of the Bureau of Mines for the year 1913. The investigation conducted by the bureau includes the reports of 294 establishments, 67 of which were reported as idle, leaving 227 plants as operating, and for which accident reports were received.

These plants employed 24,345 men and of this number 46 were killed, 342 seriously injured, and 2,172 slightly injured. The fatality and injury ratios at coke ovens, quarries and surface metal mines compare as follows:

Number Killed and Injured Per Thousand Employed at Coke Ovens, Quarries, and Metal Mines.

	Killed.	Seriously injured.	Slightly injured.
Coke ovens, 1913	1.89	14.05	89.22
Quarries, 1913	1.72	10.28	62.55
Metal mines (surface only)	2.06	21.75	92.13

The number of coke establishments is practically 575, with slightly over 100,000 ovens. The bureau's report embraces practically one-half of the operators, and 80 per cent. of the ovens, the number reported to the bureau as active being 67,526, and in addition 12,450 ovens were reported idle. While the accident figures thus collected are not complete for the entire industry yet they are thoroughly representative. No distinction has been made concerning the type of ovens in use.

Serious and Slight Injuries.

The distinction made between a serious and slight injury is in accordance with that used by the bureau in the collection of mine and quarry-accident statistics. Hence, a serious accident is considered in this report as one that would disable a man and keep him from duty 20 days or more. This class includes such injuries as broken arms and legs, loss of eye, and severe cuts and bruises.

A slight injury is considered as one that involves a loss of more than one day and less than 20 days. Under this class may be placed such injuries as cuts, sprains, mashed fingers, bruises, dirt in eye, slight burns, effect of powder smoke, etc. Of course any slight injury may become infected and thus result in a serious accident as defined above.

Causes of Accidents.

It will be noted that 13 fatalities resulted from accidents caused by cars, larries and motors, and 7 fatalities were caused by railway cars and locomotives, making a total of 20 deaths due to haulage or transportation systems, representing 43 per cent. of all the fatalities. Six fatalities were due to coke-drawing machines representing 13 per cent. of the total, and 11 per cent. to electricity.

Of the serious injuries 26 per cent. were due to haulage systems; 23 per cent. to falls of persons. Of the slight injuries 8 per cent. was due to haulage systems; 12 per cent. to falls of persons; 14 per cent. to hand tools and 16 per cent. to burns.

Since 43 per cent. of the fatalities at coke ovens are due to haulage systems, greater care and precaution should be taken to safeguard the employees who operate or work adjacent to transportation equipment. Inasmuch as electric haulage is used extensively, a large percentage of the electrical accidents may also be classified with those resulting from haulage systems, or a total of approximately 50 per cent. of all fatalities. It is in this department of the coking industry that there appears to be an excellent field for accident reduction.

These plants employed 24,345 men and of this number 46 were killed, 342 seriously injured, and 2,172 slightly injured

	Killed.	Seriously injured.	Slightly injured.
Accidents by causes:			
1. By cars, larries, and motors	13	48	74
2. By railway cars and locomotives	7	41	109
3. By coke-drawing machines	6	19	41
4. By electricity	5	8	35
5. By falls of persons	4	78	263
6. By hand tools	0	22	314
7. By suffocation from gases	1	1	26
8. By burns	2	36	343
9. By other causes	8	89	967
Total number killed or injured	46	342	2,172
Accidents by states:			
Alabama	3	37	497
Colorado	2	4	6
Illinois	2	45	514
Kentucky	1	6	39
Ohio	0	3	54
Pennsylvania	28	138	426
Tennessee	0	1	2
Virginia	1	4	4
West Virginia	1	3	26
Other states	8	101	574
Total killed or injured	46	342	2,172
Number killed or injured per 1,000 employees:			
Coke ovens, 1913	1.89	14.05	89.22
Quarries, 1913	1.72	10.28	62.55
Metal mines, 1913 (surface only)	2.06	21.75	92.13

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THE NEGRO HEALTH PROBLEM IN SOUTHERN CITIES.

William F. Brunner, M. D.,
Health Officer, Savannah, Ga.

Read before the General Sessions, American Public Health Association, Jacksonville, Fla., November 30–December 4, 1914.

The negro is here for all time. He depends upon the white man for everything that makes up a civilization. These two statements being true, he is what the white man makes him.

The negro (and this term covers not only the black man, but all those of mixed white and negro blood) numbers now about 12,000,000, and it would be an impossible task to remove them from this country. That he depends upon a superior race for everything that makes up a civilization is proved by his life history. It cannot be doubted that he took part in the ancient Egyptian civilization and though but a bearer of stone and a carrier of water, it is in evidence that he helped create cities and the Pyramids and it is equally certain that he went back to the jungle and reverted to type.

I can cite you a latter-day beginning of reversion to type on the part of the negro. The coast of Georgia is fringed with sea islands where the famous sea island cotton was raised. One island, owned for over a century by one family, had unquestionably augmented their stock of slaves by purchases of directly imported Africans, some of whom were of undoubted Berber or Arab blood, the best in Africa. The Civil War freed these people and the impoverished landowners sold scores of small holdings to their former slaves and they were, practically, left to themselves. Soon, the women and children began to raise the crops of rice, corn and potatoes, while the lords and masters worked a little and spent the rest of the time in hunting and fishing. In less than twenty years, voodooism had tainted their religion and the conjurer plied his or her nefarious trade.

Their primitive huts were only approached by narrow and winding paths. In other words, he was doing just what the dog does when he turns around several times before lying down. Placed in contact with the white man, being a good imitator, he soon tried to follow him in everything. While it will take another century for him to become a successful city dweller, he has gone forward by leaps and bounds. Illiteracy is disappearing and, in the main, he is trying hard to become a good citizen and becomes a valuable asset provided that he is numerically not more than two-fifths of the community in which he lives. If he exceeds that percentage, his progress is retarded and, in a community where he greatly outnumbers the white population, he goes ahead not at all and furnishes a low morality and a high mortality. The cities of Wilmington, N. C., Charleston, S. C., Savannah, Ga., and Jacksonville, Fla., have an excess of negroes over whites and, therefore, each one of these cities is on a sanitary parity with the other.

We will take Savannah, Ga., as an object lesson. There were in 1913 about 39,000 whites and 42,000 negroes and colored people. The deaths from natural causes for that year were as follows: whites, 442; colored, 1,038.

Annual ratio per one thousand	White	11.95
	Colored	24.71
Deaths from tuberculosis	White	48
	Colored	135
Deaths from pneumonia	White	38
	Colored	100

DEATHS OF CHILDREN UNDER THE AGE OF TEN YEARS.

Year 1883	White	214
	Colored	333
Year 1893	White	153
	Colored	333
Year 1903	White	120
	Colored	316
Year 1913	White	92
	Colored	289
Stillbirths	White	48
	Colored	230

I am going to try to demonstrate to you what the negro health problem is and the remedy for its solution. It might be said that it is not fair to these other cities to take Savannah as a guide, but with an excess of negroes over whites in each one of these cities, the same high mortality occurs.

I will take the liberty of quoting from my Annual Reports, going back nearly ten years.

(Year 1904.) The high death-rate among the negroes, who live in such colonies west of West Broad street, call for special legislation. The congestion of population there calls for legislation in the building laws. . . . The houses in some streets run in solid shacks for several hundred feet. Houses not fifteen feet wide, with four rooms, are occupied by two families of ten to twelve. These people have no fair fight for health. While they are ignorant, their environments are such that they will always be ignorant. These people are with us and to stay, and they should be protected against themselves. In doing this we protect ourselves. But few people know of the conditions that now exist in certain parts of Savannah, and, unless the city authorities take hold of this matter these abuses will continue, for this class of property pays enormous returns for the money invested. Here, children are filthy; sleep in filthy houses; eat filthy food and your attention is called to the mortality of children under ten years of age. There were 123 deaths among such white children and 330 deaths among negro children. The negro adult population also shows the result of bad sanitary conditions, the worst of which is overcrowding. There are 5,000 or more negroes in this city who are parasites and their removal would lower the death-rate and reduce crime; therefore, it is recommended that some remedy be applied by enacting building laws preventing the congestion of negroes and the elimination of the depredating class. . . .

Care of Negroes.

(Year 1906.) They are here in excess of the white population, and this means bad results from every standpoint. There are, probably, 72,000 people within the extended limits of this city and of that number 33,000 are whites and 39,000 are negroes. It is an economic fact that the negroes are, as a race, absolutely dependent upon the white people and it is just as true that 33,000 white people cannot properly care for 39,000 negroes and when this occurs the dependent race is a burden in every sense.

Last July, your health officer went over this ground at the Georgia League of Municipalities and the mayors of nearly every city represented there agreed that the above proposition held good in their respective communities.

The enforcement of the vagrant law was recommended by me at that meeting and it met with approval in some instances and disapproval in others. The main argument against it was that the present law was defective. The remedy is apparent. Revise the present law to make it of practical benefit, for if there ever was a necessity for action, it is to throw additional sanitary influences around the negro. There is but one other city that needs these measures more than Savannah and that is Charleston, S. C., the only other city that has a great excess of negroes, and it furnishes the highest death-rate of any city in the United States, according to Government reports. As suggested by me in my Annual Report for the year 1905, a commission should be appointed to look into these sociological and sanitary conditions which confront us. The city government has gone as far as it can by ordinary methods and we face the following issues: First: One set of people, the Caucasian, with a normal death-rate of less than 16 per thousand per annum and right alongside of them is the negro race with a death-rate of 25 to 30 per thousand. Second: The first-named race furnishes a normal amount of criminals and paupers and the second race of people furnishing an abnormal percentage of lawbreakers and paupers.

"Is the negro receiving a square deal? Let this commission investigate the houses he lives in; why, in his race, is tuberculosis increasing: why he furnishes his enormous quota to the chain gang and the penitentiary; investigate the industrial insurance companies, the money lenders, the installment furniture dealers, and, finally, the matter of the surplus population which is a most potent factor in producing that class of persons which is dangerous to this community and must contaminate its health and prosperity. Better the creation of such a commission, at least for this city and section, than the theoretical gatherings at Tuberculosis Conventions and Immigration Congresses. The negro is with you for all time. He is what you will make him, and it is up to the white people to prevent him from becoming a criminal and to guard him against tuberculosis, syphilis, etc. If he is tainted with disease, you will suffer; if he develops criminal tendencies you will be affected. You cannot observe these things without going where he lives in colonies in this city. Investigate them and you will soon learn that if he desires to improve his sanitary conditions, he could not do it. Observe the house he must live in: the food that he must eat and learn of all his environments."

This is no sentimental dissertation: it is a statement of cold-blooded facts that is of as much value to the whites as it is to the negroes.

(Year 1908.) While the city of Savannah cannot settle the negro problem for the country at large, the municipal government of this city owes an obligation to its people, whites and negroes, by conscientiously looking after the welfare of its inhabitants. Let us consider the issues that we must meet, facts that stare us in the face and conditions that have existed, exist now and will continue to exist unless some action is taken and the remedy applied. Look at these figures of the vital statistics for the year 1908:

	Whites.	Negroes.
Deaths from natural causes	467	939
Deaths (children under ten years)	133	297
Deaths (without a physician)	18	173
Deaths (stillbirths)	46	254
Deaths from tuberculosis	47	121
Deaths from marasmus	26	60
Deaths from pneumonia	36	91

These figures mean that the annual ratio per one thousand of population in deaths among the whites was 14.16 against 24.08 for the negroes: that, in deaths under ten years of age, it was, whites 4.30, and 7.61 among the negroes; that, in deaths from consumption, it was, whites 1.42, and negroes, 3.10. These figures mean that less than 5 per cent. of total number of white infants are born dead and that over 25 per cent. of the negro infants are dead when born. What does this mean to us? It means that these figures, in going to the Census Bureau (as they do every year) place us in a bad light and that is where we belong. Certainly, immigration will not come our way.

It has been said that other Southern cities present, practically, the same statistics. That is their business, not ours; and they, with us, will suffer from the lack of the right kind of immigration until we have a changed condition of affairs. Further than this, as your health officer has said before, their unsanitary conditions contaminate us. Once more, let me suggest that a commission be appointed—a non-political and non-partisan one—to look into these conditions and others which place the negro beyond sanitary or any other line of improvement. Let the trade bodies, the county medical society, the board of education and bar association name their representatives to investigate the condition under which the negro lives. This they will find and the statement is not based on theoretical opinion or from inferences drawn from book knowledge, but from practical experience and observation.

First: That there are from five thousand to seven thousand negroes more than the white population can support. Second: That they are so colonized that every simple law of sanitation is violated. Third: That, if they wanted to help themselves they could not do it, and, therefore, all the sanitary laws you would pass would not help the situation. This is but the sanitary side of the situation. This commission would unearth the producing causes of the abnormal number of criminals furnished by the negro race. It would demonstrate beyond doubt that there is a contamination of the white race by the negro race and this contamination is both physical and moral. There is nothing overdrawn in these statements for they are facts and even uglier facts will be found upon investigation.

Building Laws.

(Year 1909.) It is an imperative necessity that this city enact building laws which will prevent the construction of uninhabitable houses, which are so constructed that the only idea appears to be the revenue to be obtained from their rental. These houses are built with cunning ingenuity as to getting as many buildings as possible in the smallest area of ground. From a sanitary standpoint, the worst problem we have to deal with in the city of Savannah is this one. There should be laws enacted to prevent the overcrowding, not only of these houses, but to prevent the congestion of people in these houses. A midnight visit to such buildings would be a revelation to the average citizen.

The congestion of residences and of people in them is the one reason why, last year, 34 white people died of tuberculosis, and 124 negroes succumbed to that disease; and, for the same reason, 3 negro children die when 1 white child dies; and there are other diseases, causing a high death-rate which are a result of this disregard of the laws of sanitation. The moral side figures here also. Would you expect an improved morality when families of male and female children grow up in direct contact which necessarily follows when the family is restricted to one room? Would you expect normal health conditions?

It is time for the dominant white race to look this and kindred problems squarely in the face, and legislate for the betterment of these people. The municipality of the future will not be the city of the largest number of inhabitants, but of the better personnel of its citizens.

Your health officer, for nearly twenty-five years, has watched these conditions, and he is neither a sentimentalist nor does he pose as a philanthropist; but, once more, he urges the appointment of a commission (non-political) to look into the conditions which exist here. Better now than when the exigencies of some impending health or social trouble forces itself on this community for immediate solution. The collateral evils which exist here need the work of such a commission as do the lack of sanitary habitations and surroundings for the negro.

(Year 1910.) Your health officer has always held that the prevailing American idea that the city which shows the greatest increase in its population is the city which attracts the best class of citizens, is an erroneous one. He holds that the city which provides best for its citizens is the city which will finally attract the best people to it. This city stands preëminently in the front rank of American cities in the safeguarding of the health of that class of its people who need help, yet we have with us a population which needs help extended to them, of which they are sorely in need. To improve these people in their health and morals is a duty we owe to them and to ourselves.

I refer to the negroes, a population which is easily in excess of the whites. A people, or that portion where the negro blood predominates over the white blood, depends absolutely upon the white race for everything that makes up a civilization. If he is allowed to remain here as he is, he will be a menace to himself and to us. That he is better than he is generally thought to be is self-evident to one who has observed him carefully for years. Judge not the race by observations of him in the criminal courts, nor in the hospitals. While he is not a white man painted black, with all of the mentality and morality of that race, neither is he incapable of improvement over his present position. Unless you legislate for him so that his sanitary condition will improve he will continue to furnish a high mortality.

Note how many of his children are born dead and then follow the high infantile mortality up to the fifth year, and then go and observe carefully the reason for it. It would be just the same result with the white race if they lived in the same environments. Certainly, the death-rate among the children would be the same. Born in closely congested districts in the least healthy parts of the city or in narrow lanes, he seldom has a fair chance for a healthy existence.

After he is grown, he gets no better chance, he is in the same bad sanitary environments and loses his resisting power to disease, the same as any other human being would under the same conditions. For proof of this, see his death-rate from tuberculosis and pneumonia. This is but the sanitary aspect of him.

Again, your health officer would recommend that a commission be appointed to inquire into why he dies in excess of the whites; why he is a bad citizen in the eyes of the law. Investigate his manner of living and investigate those who live on him.

This recommendation is made for the public good; it is made in order that we may better ourselves.

(Year 1913.) Deaths from natural causes: Whites, 442; colored and negroes, 1,038; total, 1,480. Annual ratio per one thousand: Whites 11.95; colored and negroes, 24.71; total, 1,898. The estimate of the population is 37,000 whites and 42,000 colored and negro, a total of 79,000. You will observe that the death-rate of the whites is less than one-half that of the colored and negro.

The following figures show the two principal causes of death:

	Whites.	Colored and negro.	Total.
Tuberculosis..........	48	135	183
Pneumonia...........	38	100	138

Once more, we are faced with the evidence of our neglect to safeguard the white race by disinclination to recognize the negro as a potent factor in the transmission of disease. If you continue to allow him to be herded in the basements of houses and to be colonized in crowded districts, you will suffer. The negro of the lower class is thrown into domestic contact with you and he furnishes 80 per cent. of your household help. You cannot keep pace with modern sanitation unless you care for him.

Deaths Under Ten Years of Age.

The following table is instructive:

Year.	White pop.	Col. pop.	White deaths.	Col. deaths.
1883	20,000	24,000	214	333
1903	29,000	33,000	104	316
1913	37,000	42,000	92	289

This is the result of two conditions: One people (white) are learning to observe the laws of sanitation and this city is advancing in the enactment of laws for safeguarding the health of white children. This remarkable reduction in the deaths of white children is largely due to the enforcement of the milk laws.

If it were possible for negro children to live, under even approximately the same conditions, they would not furnish three deaths for every death occurring among the whites.

There is in Savannah a condition which is interesting to the sanitary observer. I refer to a section of the city where dwell two races of people, differing widely in every respect save one thing, which they possess in common—their dirt. A narrow street divides these people, the Russian Jew from the negro. The first named have the lowest death-rate of the city, while the death-rate of the other is five times as great as that of his neighbor. The one, the hardiest race of city dwellers in the whole world, the other but a comparatively short time from the jungle.

The negro is going ahead in spite of our neglect of him. He is a good workman and finds employment, whether as carpenter, painter, or any of the other trades. While pneumonia and tuberculosis are his greatest foes, he has what appears to be a partial immunity to certain diseases not possessed by the white race, namely; two diseases of childhood: diphtheria and scarlet fever. For some years it was my opinion that these two diseases were existing among them, unknown to the health department. With the close contact of the two races, these diseases could not fail to be transmitted to the white race if it existed uncontrolled among the negroes.

I would here make public acknowledgment that, after twenty-five years of closest contact with the negro race, I have seen a wonderful improvement in him as a man and as a citizen. An exemplification of this is but to tell you that the concealment of transmissible disease is a thing of the past. It has been demonstrated in Savannah that, after being cared for in a humane way, he seldom conceals smallpox and, I say with some pride, no negro patient ever leaves our smallpox hospital who will not report that disease to the health department.

The Southern man is the negro's best friend, but they do not realize the line of sanitary endeavor necessary for the care of the negro. There are many of our profession who are inclined to hold aloof from these people on account of racial superiority. I can assure them that there is no contamination to follow. I meet with them as a race, with their leaders, and do not hesitate to address them at any time or place for their sanitary betterment. I say it to you that, if you wish to keep pace with modern sanitation, give them a square deal.

THE NEGRO HEALTH PROBLEM IN RURAL COMMUNITIES.

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Read before the General Sessions, American Public Health Association, Jacksonville, Fla., November 30-December 4, 1914.

Many interesting articles have been printed relative to negro health problems. A large percentage of these have been presented by those who live in cities or educational centers, and view the subject from the standpoint of the city man or woman. Many statistics are presented as to the relative death-rate of the white and black races, but so far as the subject assigned to me for discussion is concerned, these articles are of no practical value except as a matter of comparison,

Ignorance and poverty on the part of the negro and indifference caused by ignorance on the part of the landlords and voters, are the prime factors in the "Negro Health Problem in Rural Communities" as I view the situation. The statements which I make in this article are based on my experience of six years as a practicing physician in a representative section of rural Southwest Georgia, U. S. A., and five years as Director of Field Sanitation of the Georgia State Board of Health, fighting hookworm disease.

Ignorance, lack of knowledge of practically all of the sanitary laws, is responsible for many diseases among this race. Typhoid fever and diseases produced by infection in the alimentary tract caused me the greatest concern. The natural resistance of the negro to these diseases was in my experience far below that of the white race. You have but to visit the homes, churches and schools in any rural section to get your answer,—Why the prevalence of such infections? Less than 50 per cent. of the negro homes inspected have privies of any type and a very small per cent. of the schools and churches. The springs and wells become contaminated and these diseases of "soil pollution" become endemic. Screens are almost an unknown proposition and flies carry disease germs to their food, particularly the infant and small child, and many suffer and die. The proper disposal of infective material is unknown except in a few instances, and then it is improperly executed through ignorance. With sanitary conditions as to soil pollution as they are, who can wonder that hookworm disease, typhoid fever and other infectious diseases of the intestines are prevalent.

Another problem with which they have to deal is tuberculosis. While this may not exist to so great a degree among this race in rural communities as in crowded sections of cities, it is a great menace, and takes its toll of thousands. But few negroes know that this is, as they call it a "catching disease." They consider it purely a matter of heritage. Believing thus, they put forth but little effort to prevent it. Visit with me, if you please, a typical negro community. There are probably one dozen houses, of from one to three rooms. Many of them have two families in the same house. These houses are scattered over a few acres of land and are known as "the quarters." One or two wells, and often a spring furnishes water for all of them. The woods and underbrush furnish a place of privacy, and this area reeks with the vilest of human waste. In one house, we find a case of typhoid; in another, a case of tuberculosis and often a case or two of active syphilis; one or two will probably harbor the *plasmodium malariæ.* The family washing is done near the spring and as small puddles of water are ever present, mosquitoes abound.

It is a peculiar failing of this race that where sick and sorrow are, there friends and neighbors render all aid in their power, so after a day of hard work, their resistance at its lowest, may come to sit up with the sick. Under these conditions, is it any wonder that many contract these diseases?

Are they financially able to help themselves? Why the average annual income of these families is not more than $240!

Typhoid fever, hookworm disease, malaria and all of the infectious and contagious diseases spread from these foci of infection.

Picture the school-house and church a few miles away, with the spring or well and with sanitary conditions on a par with the homes. These, then, become the places for dissemination of disease as well as knowledge. Why I have seen them at their churches and schools with smallpox.

We have paid dearly for these conditions in both life and money, but what are we going to do and how shall we do it? Educate them and at the same time educate all along proper lines and poverty will cease to be the menace it now is. The landlord will begin to understand that health of his employees pays. The voter will instruct his representative to support health laws and appropriations. Then with the health laws we now have, supported with necessary funds, place in operation the laws of sanitation and completely change the habits of a people which will demand much time and patience, but it is well worth the price.

The state boards of health, the national public health service, the national and state departments of education, antituberculosis associations, civic leagues, women's clubs, the press, etc., have already done much in this line of education, but the knowledge disseminated through these agencies has not reached the homes of the negro in the country districts to any appreciable extent. We must ever be mindful of the fact in spreading the gospel of health that disease is no respecter of persons or race. Doctor Kennedy of Tuskegee, Ala., very nicely expresses it when he says, "It cannot be denied that, whatever may be done for the uplift of the negro as a race, at the same time helps the general public." So we must reach them by direct teaching.

It has been stated, and I believe is generally accepted, that we have sufficient knowledge which, if properly applied, would stamp out preventable disease. If this is true, then why do we not stamp it out? The answer has been given—ignorance. How are we to reach the rural negro, teach him and protect him? Teach the simple laws of hygiene and sanitation in the schools and begin this subject early, say the second grade. This will, in due time, make it easy for the health officer in his work. Then give to the rural districts modern standards of cleanliness and modern local and state machinery for applying sanitary methods everywhere, supported by local and state taxation.

THE NEGRO HEALTH PROBLEM.

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Read before the General Sessions, American Public Health Association, Jacksonville, Fla., November 30–December 4, 1914.

The negro health problem is one of the "white man's burdens," and it is by no means the least of those burdens. It is at once the most serious and the most difficult health problem with which the people of the South are confronted.

The statement that "None of us liveth to himself, and no man dieth to himself" is as true today as it was when the Apostle penned it to the Romans nineteen centuries ago. And it applies with as much force to our "brother in black" as to any other man. Because of the fact that no negro liveth to himself nor dieth to himself the negro health problem is not alone a question of concern to the black man, but is one of equal moment to the white population in communities where the negroes are found in any considerable numbers. Disease germs are the most democratic creatures in the world; they know no distinction of "race, color, or previous condition of servitude." The white race and the black race will continue to live side by side in the South, and whatever injuriously affects the health of one race is deleterious to the other also. Disease among the negroes is a danger to the entire population.

Communicable diseases find their favorite propagating grounds in the dirty negro sections of our cities, and in unsanitary negro homes in the country. From dirty homes, in these disease-infested sections, negro people come into intimate contact with white people every day that passes. We meet them in our homes, offices, stores, in street cars, and almost everywhere we go. The fact is not pleasant to contemplate, but is nevertheless true, that there are colored persons afflicted with gonorrhea, syphilis, and tuberculosis employed as servants in many of the best homes in the South today. In every instance the employer is, of course, unaware of the risk being taken. Various diseases are often spread in this way.

It is undoubtedly true that the negro race has deteriorated physically and morally since slavery times. In some ways he is perhaps more intelligent, but freedom has not benefited his health, nor improved his morals. There is more sickness and inefficiency and crime among them now than before the war. All old physicians tell us that in slavery time consumption was practically unknown among the negro race. This fact, I believe, is thoroughly established. But how is it with them now? The figures speak for themselves. In the year 1911, as set forth in Census Bulletin number 112, the death-rate per one hundred thousand from tuberculosis of the lungs, in the registration area, was 162.2 for the whites, and

405.3 for the negroes. In other words, the death-rate of the colored people from this disease *is more than three times the death-rate of the white population.* In Jacksonville the rate for the whites 154.4; that for the negroes is 319.5. In Atlanta the white rate is 109.9, the black rate 297.4. In Savannah the white rate is 118, the black rate 328. Everywhere you look the proportion is about the same.

Because of the excessive death-rate among the negroes from tuberculosis the impression has gone forth, and has been widely accepted as true, that the negro race has a peculiar susceptibility to this disease. When all the facts are considered it seems to me that such a conclusion is not justified. Why was the negro free from tuberculosis during slavery time? The answer is obvious. Then he was disciplined; then he was made to bathe, and to keep clean; he was furnished a comfortable cabin in which to live, which he was required to keep scrupulously clean; he was given plain, but wholesome food, in generous quantities; he was made to stay at home at night, and rest, that he might be able to work; he was not allowed to roam the country, but was kept at work regularly, and was taught how to do his work in a skillful manner; he was not allowed liquor, nor indulgence in vicious pleasures; if he became ill the best physician obtainable was called to treat him. The health of the children was carefully looked after. It was to the slave owner's interest to do these things. The more efficient the slave the more valuable he was. A sickly negro was of very little value—a dead negro none. There was no more healthy race of people to be found anywhere in the world than the slaves of the South before the Civil War.

When freedom came, and all restraints removed, the negro began to indulge in all kinds of dissipation, and to practice all the vicious habits known to civilization. He now had to "shift for himself," and not having any experience in providing a living for himself and family (because the master had always done this) and thinking that freedon meant release from all work, he got along very badly. Like a child turned out in the world, homeless and penniless, he became the prey of any rascal who was disposed to take advantage of his situation. To make bad matters worse, his unwise friends rashly gave him the ballot before he was sufficiently intelligent to use it properly. Then, designing politicians, with insane political propositions and policies, proceeded to stir up all manner of race hatreds and prejudices, which had not existed previously to that time, and which has not yet entirely disappeared, but which, I am glad to say, is gradually passing away. All this was bad for Cuffy—dreadfully bad. Hurtful ideas got into his head. He became unreliable. Criminal tendencies grew upon him, and evil ways overcame him. He was prosecuted and persecuted. He often went hungry, picking up food when and where he could find it. His clothes became ragged, his home filthy, his children neglected. Disease began to prey upon him. From this deplorable condition into which the negroes were precipitately plunged at the close of the Civil War, they have not yet emerged. The present generation of negroes have grown up amid very unfavorable surroundings, and without home training, or discipline. Many of them have not had a bath since infancy. They live very irregular lives. They often roam about at night, some of them indulging in licentious debaucheries of the most disgusting character. Their homes are filthy, and their home language unchaste. Their girls early learn evil ways. Ignorance and superstition take the place of science and skill in the care of infants. I have never seen a negro mother who was unable to nurse her infant at the breast, but notwithstanding this fortunate circumstance the death-rate from enteritis and diarrheal diseases is excessive among them, being, in children under two years of age, 75.9 for the whites, and 111 for the negroes. It is the lack of physical and moral cleanliness that causes the death-rate to be so much more among the negroes than it is among the whites. Go into their homes and investigate for yourselves. You will never realize the true situation until you do. In the homes of the best of them you will find the front part of the house in pretty good condition, but the kitchen and back yards are neglected. In most instances the house in which the colored man lives is too small for his family. Miss Frances M. Kinney, a colored lady of intelligence doing social work among the negroes of my county, under the direction of our board of education, in a letter to me says: "I have in mind now a family of twelve living in a three-room cottage. They sleep without any ventilation whatever, and are as filthy as pigs. They go half-clad, and from three to four sleep in one bed, some sleeping in the cook room." Again she says: "The men and boys are stronger and healthier than the women and girls." She says the women in the rural communities do more work than they are able to do, often doing as much work in the field as the men, besides doing the cooking and housekeeping. She continues: "The next generation of negroes will be weak, yes, consumptives, unless something is done to strengthen and protect our girls, who are to be the mothers of the next generation." Miss Kinney goes on to say that her people are very careless with contagious diseases, allowing children to eat and drink after patients afflicted with consumption, and to sleep with such persons.

Again, old physicians tell us that in antebellum days the negro race was practically free from venereal disease. Now syphilis and gonorrhea are very common among them. In fact very few negroes escape one or the other of these diseases. Many negro women have gonorrhea, and pay little attention to it. This is a very real menace to our white boys, and through them, after marriage, to our innocent daughters also. For, despite our best efforts, many boys are going to sow wild oats. Even Solomon the Wise, in his mature years earnestly exclaimed: "Remember not against me the sins of my youth." Evidently the old king had reference to his youthful wild oats. Sterility among the negro women is becoming quite common as a result of the activity of the germs of Neisser. The birth-rate among them is diminishing. The tremendous amount of evil that venereal disease is doing the negro race is incalculable. If the spread of syphilis, gonorrhea and tuberculosis among the American negro is not checked, this once physically superb race will become extinct with a few generations.

I contend, then, that it is not a peculiar racial susceptibility to tuberculosis that is causing this disease to destroy so many people among the negro race, but his environment—his bad habits and his insanitary conditions of living. The same causes operate to produce a high death-rate from other filth diseases. Take for instance puerperal fever. The death-rate from puerperal sepsis in the registration area is just about twice as great among the negroes as it is among the whites. But for the circumstance that all negro mothers nurse their infants at the breast the death-rate among their babies would be appalling. I suppose that when negro women adopt modern styles of dress, and modern social customs, they will also begin to give their babies the bottle. By an examination of the Census Bulletin referred to above, and other health reports, it may be seen that those diseases that are caused from filth, contagion, carelessness, insanitary living conditions, and exposure to cold have a high death-rate among the black population. The death-rate from pneumonia is 128.4 among the whites, while among the negroes it is 252.2. Other diseases that have a notably high death-rate among the negroes are: smallpox, typhoid fever, whooping-cough, rheumatism, influenza, and organic heart disease. It is worthy of remark that the negro race possesses, apparently, a notable degree of immunity to scarlet fever, the death-rate from this disease being eight times as high among the whites as it is among the negroes. According to my personal observation enlarged tonsils and adenoids are extremely rare among them. Mouth-breathers are infrequent.

Negro children, as a rule, are neglected, not receiving proper training at home. Their ailments are given too little attention. Food is often lacking. Parents are incapable of giving their children proper care and training. The schools teach only book-learning. Many are allowed to grow up in idleness, and often acquire habits of indolence and vice.

The negro's health condition will remain bad until his intelligence is greater, and until his financial condition is improved. On account of his poverty, his food is of the cheapest variety, and it is badly cooked. It is a real wonder how millions of negroes manage to live and do good work on the kind of food they are forced to eat, and the character of cookery they get. Frances Kinney, herself a negress, has lived and worked among negroes all her life and knows what she is talking about when speaking of the negroes. In a letter to me Miss Kinney says: "The average colored family live principally on meat (bacon) and bread, which is poorly prepared, especially for school children. The meat is generally fried, and lunches are put up hot in tin buckets, and on opening at lunch time the food has a very disagreeable odor, often driving away the appetite of a delicate child. The meat is soft and soggy, and the bread is in about the same condition."

In answer to a question Miss Kinney says: "The colored people do not have any regular hours to take their meals. They are very careless indeed about going to bed, but get up at a pretty regular hour. It is common for a family to sit up until 12 or 1 o'clock at night, and get up at four in the morning. Many of the women work until a late hour, but when not at work they naturally sit up from force of habit. This habit was handed down to us from a former generation."

I asked Rich Young, a preacher and schoolteacher, if it were true that his people, as a rule, sit up late at night. He answered that it was true, and that many of them *stayed up all night*, and that many of them roamed the neighborhood at such times.

There is no doubt that the habit of staying up late at night, and even all night, is common throughout the negro world. This habit is helping to undermine the negro constitution. It was not allowed in slavery times.

A noticeable defect in the negro character is the want of initiative. He waits to be told. Give him orders, tell him what to do, and set him at it, and he is all right. This lack of initiative in the negro character has far-reaching effect on the condition of the race, But I cannot go into this here.

Habitually careless about most things, the negro is especially careless about caring for the sick. Frances Kinney says: "The day has come throughout the country that you suffer when you get sick if you are not a member of some good society, or club. In the church it takes all the money for the preacher, and he hardly ever has anything. The negroes are only too ready to shield and protect a criminal, whom they regard as a sort of hero, but a sick negro they often regard as a nuisance. In the majority of negro families the sick are never bathed, and their clothing and bed clothing are not changed for weeks at a time. The room is not aired, nor kept clean. In rural communities the negroes often live inconvenient to physicians, and they have no money with which to employ medical attention. In my county it is a common practice for landlords to employ physicians to look after their tenants. Physicians also do a great deal of charity work among them, but they cannot do all that needs to be done."

The negro is not lazy. He is not afraid of work. He will undertake hard jobs which the white man shirks. But he loves carnal pleasure, and he lacks self-control. In other words, *he possesses powerful propensities for pleasure, but his inhibitory centers are rudimentary and weak.* This important fact should never be lost sight of in studying any negro problem. This peculiar mental make-up accounts for many of his follies, and most of his crimes. He is unable to withstand temptations and enticements. In slavery times his master's authority restrained him. For this effective control our preaching and teaching have proved a "broken reed."

The negro men love to frolic with the women; and the women love to frolic with the men; so they frolic. The negro loves to drink—and he drinks. He is especially fond of congregating with other negroes, and this is the reason he stays up so late at night. He attends church regularly—unless there is somewhere else to go. He goes to all the shows and picnics. He attends all the camp-meetings, and—all the dances. At such places he often gets into a scrap with some other negro, and shoots him or stabs him, or else "gets it in the neck" himself. It matters not how grassy his cotton, if the railroad runs an excursion anywhere he will go or die. He never misses a funeral. I once had working with me a negro man who made me a good hand, except that he would sometimes get drunk. But every time a negro died anywhere he had some excuse for going to the funeral. He would come and ask permission to go, stating that the dead negro was his uncle, or his aunt, or his cousin, or some other relation. Never a negro died anywhere that was not some kin to him.

In going to these places of amusement the negro loses a large part of his time, and causes his employer much annoying inconvenience and loss.

Every one conversant with the facts admits that the negro health problem is an important problem, which imperatively demands attention. The question is: What are you going to do about it?

After all, the problem does not differ greatly from the same problem regarding certain portions of our white population.. Ignorance and poverty are everywhere associated with disease and vice. Filth and contagion, coupled with ignorance and indifference, always bring about disease and death. The remedy of greatest importance is—*education*. But by the term "education" I hope I shall not be understood to mean the kind of learning the negro has been getting for the last fifty years. Millions of dollars have been spent, and thousands of teachers and others have devoted many years of earnest labor to the education of the negro, and as a result of it all we find the negro race as a whole in a worse condition than they were in slavery times. True a few negroes have accumulated property; a small number have become markedly intelligent; a few have become skillful laborers; but the great mass of common negroes are today densely ignorant and poverty-stricken. Most of them are unskilled laborers, working for small pay; not a few are vagrants; some are in our almshouses; a very large per cent. of them are diseased; and quite a large number of them are in our jails and chain gangs. These facts cannot be denied. I contend, therefore, that the kind of education we have been trying to give the negro has been a disappointment.

Every negro child has had what we may term a preliminary education. This preliminary education was begun several hundred years before he was born. His education can be continued and finished successfully now only if it is conducted in accordance with his preliminary preparation. Human beings show a great many grades of intelligence, and a great diversity of talents. Some are so defective in intelligence that they have to be cared for like infants. Now I contend that in the education of any child, of any race or color, it should be taught according to its capacity and grade of intelligence, and its probable opportunities in life. What the negro needs is an education that will take the place of the discipline which he received in slavery times, and that will fit him for some useful employment that is open to him. The negro will remain poor until he becomes sufficiently skilled to earn better wages than he now gets. But no matter how much he *earns*, he will still remain poor until he acquires habits of economy, and quits spending his money for liquor, and on loose women, and quits squandering it in gambling, and in other ways that hurt him instead of help him.

The negro should be taught to work, and trained to keep regularly at it. He should be made to understand the value of time. He should be taught thrift. Proper ideas of cleanliness, sobriety, chastity, honor, and self-reliance should be instilled into his mind. These things are indispensable to his welfare. Some of the wisest negroes are beginning to see the wisdom of giving the negro an industrial education instead of teaching him Latin and Greek.

The physician should be consulted, and his expert knowledge made use of, in the education of the negro race. What is the object of an education? Evidently, it is to fit the child for the duties of life; to train and develop its physical, moral and mental potentialities so that it will be able, in the "struggle for existence," to fight its own battles, and to prosecute successfully whatever calling or business it may undertake for its life work. To succeed in life it is as necessary that a person be efficient physically as it is that his mind be developed. Good character, good habits, and skill in working with the hands are more valuable than a knowledge of the elementary branches of an English education. And an education that does not teach cleanliness and the proper care of the body is a defective education.

A large per cent. of the negro schoolhouses are dirty and insanitary. They are not ventilated, especially during the winter time. The privies are unspeakably filthy, and infested in summer with swarms of flies. At some schools there are no privies, and the children have to go to the woods, which means the spread of intestinal parasites transmitted through the soil. Children with physical defects, in both the white and the black races, are being neglected because their parents are not sufficiently intelligent to have them given proper medical attention. If a child with any of the more serious diseases or defects, such as hookworm or adenoids, is allowed to grow up and reach maturity with such troubles unremedied, such a child will be seriously handicapped for life. Having had his development retarded during his formative period of life, he finds himself at maturity weak in body and mind, and burdened with disease, and unable to cope with strong men in any calling or pursuit. Hence our educational methods should be changed. The development of a sound body should be the first object of an education. It is a regrettable fact—an exceedingly regrettable fact—that very much of the physical and mental inefficiency seen on every hand today among adult men and women could have been prevented by intelligent care during childhood. The remedy for these evils is the medical inspection of schools. This should not longer be put off. Sound principles of economy alone justify it. Every sentiment of humanity and patriotism demands it.

I am convinced that we cannot depend upon the negro churches for much help in bettering the condition of the negro race. The churches are in a rut, and cannot get out. In them there is too much sentiment, and not enough sense; too much praise, and not enough piety; too much glory-hallelujah, and too little sound morality.

A colored lady of intelligence says: "Our preachers are not what they ought to be; they go in too much for money, and not enough for the happiness and welfare of their people. They would do more good if they would stop preaching so much about heaven, and teach the people how to *live right*, in neat clean homes—homes that are clean physically, mentally and morally. More stress should be placed upon the word *live*."

A good friend of mine, a physician, says: "You might as well try to teach sanitation to mules as to try to teach it to the negroes." With this opinion I do not fully agree. I admit the task is a hard one. Progress will be necessarily slow. But the negro is not incapable of learning. It is our methods that are at fault. In some of the schools in our county, thanks to Frances Kinney, they have individual drinking cups, and nice lunch baskets made with their own hands. In this respect they are more advanced than some of our white schools. The trouble with the negro is not so much his inability to learn as it is his carelessness and indifference in doing that which he is taught to do.

Clubs of various kinds have been organized among the negroes of my state (and I suppose in other states), and from what I learn some of these clubs are doing valuable work, more valuable in character than that which their churches are doing. Parents meet with the children in these clubs, and all are anxious to learn. This work, however, is quite limited at present. I am told that mothers who have been instructed in these clubs are trying to keep their homes cleaner and more sanitary.

It occurs to me that these clubs give us a clue to a solution of the negro health problem. Improvement clubs, formed somewhat after the manner of the boys' corn clubs, and the girls' canning clubs, organized at every schoolhouse in the land, would offer a sane and practicable method of solving the problem, or at least greatly improving the present conditions. On account of the negro's gregarious proclivities it should not be difficult to secure a large attendance at these club meetings. Capable teachers, physicians, and social workers should be induced to help in this work. These clubs should be a kind of school for all ages. In addition to improved methods of farming, stock raising, poultry raising, etc., hygiene and sanitation should be taught at these meetings. Prizes might be offered for various things, as for the woman who has the cleanest house and yard. By teaching these people a few simple facts an inestimable amount of good might be accomplished. The women should be instructed in cooking, and the care of infants. The manner in which tuberculosis spreads from the sick to the well, and the approved methods of preventing the same, should be explained. They should be made to know that typhoid fever is an infectious disease, and instructed in methods of disinfection and cleanliness, and informed of the benefits of typhoid vaccination. They should be told how the mosquito spreads malaria, and instructed in methods of prevention. They should be told of sanitary privies, and that houseflies are as dangerous as mad dogs. They should be especially instructed concerning the two twin enemies of the negro race—gonorrhea and syphilis. Many other things will naturally suggest themselves to you. Let them understand that disease, for the most part, is under man's control. Divest their minds of the vague superstitions which most of them harbor concerning the causation of disease, and make them understand that disease is caused from uncleanness, alcohol, germs, bad habits and bad morals. The negro should be inspired to think more of himself, and to place a higher value upon his life. Call their attention to the remarkable old age which many of their ancestors reached, but to which few of the present generation can hope to attain. They should be taught the great value of sleep, which they do not seem to appreciate.

In conclusion, the health of any people is the foundation upon which their happiness and prosperity and usefulness rests. If the individuals of any race yearly diminish in stature and physical strength, that race is doomed.

The negro race in America is deteriorating, and at a rapid rate. The death-rate among them from filth diseases is alarming. The race is headed toward destruction. Unless something is done to arrest the spread of disease among them the race will go as the American Indian went within a few generations.

The educational and religious efforts that for fifty years have been employed to better the condition of the negro race have been disappointing. Our educational methods should be changed radically.

Every influence that helps to increase the negro's efficiency, everything that encourages him to become productive and self-sustaining, and that helps to make of him a better citizen lessens the "white man's burden."

The fundamental source of disease, as well as of vice and crime, among the negroes is shiftlessness, ignorance, and poverty. The remedy is a systematic, *disciplinary* training of his physical, mental and moral powers.

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THE TRAGEDY OF VACATION TYPHOID.

Most of our summer resorts have grown up in a haphazard way so far as sanitation is concerned. Many summer resorts, while attractive looking, are really no better than primitive camps or boom cities. There is often an utter disregard of the elementary principles of preventive medicine. Frequently there is no organized health department whatever; no systematic disposal of sewage; bathing beaches are often visibly polluted; the fly menace and mosquito danger are not checked; nuisances are permitted without abatement; no supervision is exercised over the water supplies, and no surveillance is maintained over the milk and other food supplies. Under these circumstances, health resorts become death resorts.

The principal business of a vacation playground is carefully to safeguard the health of the strangers within its gates. There is only one known way in which this can be done, and that is through a well-organized health department, properly supported. Health resorts can no longer trust to climate, charm of location, beautiful scenery, and luck for a good health record. Most of our health resorts need a sanitary house-cleaning. In order to do this effectively, it requires a full-time health officer, qualified and trained for such work. After a place is put in good sanitary condition it needs constant supervision and expert care to maintain a good health record. It is the duty of state boards of health to instruct the people to demand a clean bill of health from a summer resort before going there; and it is the duty of the state board of health, on the other hand, to impress upon the summer resort the importance of placing its house in order.

In this issue of the JOURNAL, a report is published by Professor Councilman and his colleagues showing the way York, Maine, met its obligations in this regard. This report is published because it appears to us to be a model of its kind. Typhoid fever prevailed last summer at York. Instead of hushing up or trying to hide the facts, the authorities of the town realized that the best way to meet any danger was to face it in the open. A sanitary survey was made, and one of the chief recommendations was that York needed a full-time health officer. William Eustis Brown, a graduate of the School for Health Officers of Harvard-Technology was given the position, and the town appropriated $2,500 a year which is approximately $1 per capita, a larger sum than is spent directly for health by any other American community.

Other health resorts will find it to their interest to adopt the policy of "safety first," for the people are wary and the stigma of typhoid fever, or a bad health record, will greatly injure the summer business of any health resort. Public health is purchasable; the price is moderate; the tragedy of vacation typhoid must cease.

COÖPERATION IN PUBLICITY.

One of the conspicuous movements in public health work today is that of publicity—directed both to education of the public in hygienic principles and to the strengthening of sanitary administration through adequate financial and moral support. Another movement, not less conspicuous, is that of coöperation, of correlation of the various public health agencies in order to secure the resultant strength and economy. And now, at the point where these two movements blend, we find the application of coöperative methods to publicity work.

Not long ago the health officer or civic organization which desired to produce a health exhibition, or even a simple exhibit, found it necessary to collect data, to plan models, charts, or what not, and to go to considerable expense to have these constructed. Then, after all, the results frequently did not come up to expectations. Time and money were spent more or less inefficiently and disappointingly.

But publicity has now become a specialty and the construction of publicity material, from models and charts to lantern slides and printed matter, an art in itself. From a number of specialized sources—public, semi-public, and private—excellent exhibition material may now be bought, rented, or borrowed. It is a fact of very practical importance in the publicity campaign now so generally taken up by progressive health departments, that practically any material which may be needed can be secured, at costs adapted even to the very limited means, by getting in touch with one or more of those sources. The JOURNAL will be glad to send a suggestive list of sources from which publicity material can be obtained to any who will write for it. Such material is planned by publicity specialists; the execution is of the best, and the local health officer has but to choose his subjects, send for his material, and place it upon public view. Even to the smallest town, which can at the start afford nothing more, a single piece of effective exhibition material, dealing with a pertinent subject, exposed in a vacant store window, should well repay the small effort and expense of securing it.

SIGNIFICANCE OF THE ROCHESTER MEETING.

Because of the exceeding great noise in the world, we beg leave to drop our editorial dignity and shout. With a strong voice full of hope and enthusiasm we want to announce to the whole continent the coming meeting of the American Public Health Association at Rochester, N. Y., September 7–10, 1915. Above all the international roar this is to be distinguished as one note, clear and significant. It means that underneath the deeply disturbed surface of human life, the advancement of humanity, the work of sanitation, prevention of suffering, and improvement of human kind is moving forward hopefully and undismayed. It is expected that this convention of public health workers will be the largest and most important that the Association has known in its history. An organized effort is already being made to insure an unusually large attendance at this meeting in Rochester. The city chosen this year is easily accessible to a large majority of members. All those who live within moderate distances of Rochester should decide now to go, and arrange their fall work accordingly.

Moreover, it is planned that the New York State Conference of Health Officers meet with the Association in Rochester, September 7–10. All of the several hundred health officers of New York state should be members of the American Public Health Association before they go to this joint conference in September.

It will be an extremely important meeting, also, in matters concerned with the development of the Association itself and with the organization of national health work. Among other things is the proposed adoption of a revised Association constitution, which a special committee is now preparing for presentation. Other committees are already at work arranging an excellent scientific program, and the local committee in Rochester is making thorough plans for the reception and entertainment of all who attend.

Members of the Association all over the country should be working now every day among their friends and professional acquaintances to secure new members to bring with them to this Rochester meeting. There could be no more significant mark in the record of American civilization than the brilliancy of a successful meeting of the American Public Health Association shining out against the dark background of the year 1915.

THE NEGRO AS A PROBLEM IN PUBLIC HEALTH CHARITY.

Lawrence Lee, M. D.,
Savannah, Ga.

Read before the General Sessions, American Public Health Association, Jacksonville, Fla., November 30–December 4, 1914.

In considering the question of the negro as a factor in public health, first let us look into the type of diseases with which he is most commonly affected. Dr. C. E. Terry in his article read before the American Public Health Association in Washington in 1912 and before the Southern Medical Association in 1913 at Lexington, Ky., shows that tuberculosis and other respiratory diseases and still-births cause a death-rate of 917.9 per 100,000 against a rate of 354.7 for whites. The Savannah Board of Health reports show for 1913 the death-rate from the same causes to have been 1,185 per 100,000 for negroes against 375 per 100,000 for whites. The disease most prevalent among the negroes, however, does not show in these figures.

I have found from personal experience, and I am sure that those doctors present who have had the disagreeable duty of treating any large number of the negro race have found, that venereal diseases are present in over 50 per cent. of those presenting themselves for treatment. Syphilis has as much to do with the high death-rate in the negro as any other single factor. It does not show on the death certificate, but as a complication of bronchitis, pneumonia and tuberculosis, it reduces the chance of a successful fight against these diseases, and as a cause of arterio sclerosis, endocarditis, cerebral hemorrhage, nephritis and still-births it seems to be ever present.

As city physician during three years I treated 1,426 negroes, 486 of whom (about one third) had syphilis in some evident form, to say nothing of those who came to me with minor injuries, biliousness, etc., who only paid one or two visits and in whom the disease was latent, and in whom I did not make the diagnosis. I personally believe that more than 50 per cent. of the colored race suffer with this disease, either inherited or acquired. If this be the case, as I believe it is, syphilis is almost *the* important factor in the high death-rate of the negro race.

How much through the negro race the white race is affected with this disease I am unable to state. I have never seen a case in a white contracted innocently from a negro and have heard of but few. This goes to prove that syphilis must be very slightly contagious in ordinary daily contact. The negroes live in our homes, care for our children, wash our clothing, cook our food, and if syphilis were very contagious from ordinary contact numerous cases of syphilis of the innocent among the whites would have been reported.

As long as conditions exist as they do at present in negro homes, schools and hospitals, the prevalence of infectious diseases, especially such diseases as syphilis, tuberculosis, respiratory diseases, typhoid and malaria will increase rather than diminish. Negroes do not seem to be particularly subject to other infectious diseases, except smallpox, and vaccination is the prevention for it.

Let us look briefly into these conditions. I can speak from personal knowledge only of conditions in Savannah, but I am sure that conditions here are no worse than in the average southern city.

Their homes are usually one-story cottages, built in long rows of tenements, close to the ground, with small windows. In these homes a large number of people crowd, so that the negro section is very densely populated. In the district where the negroes live the house drainage system has not been installed as yet in all the houses, although rapidly being installed, and there is still a good sprinkling of the old-fashioned privies.

Living under such conditions typhoid, while never to my knowledge epidemic among them in Savannah because they cannot afford milk, and the water supply is fine, is always endemic and a constant source of danger to the city with the added danger of an epidemic among the whites through negro carriers working in a dairy.

The negroes hate cold, and it is almost impossible to get them as yet to open the windows of their homes in winter or if they are sick. Crowded as they are and fearing ventilation no wonder tuberculosis and respiratory diseases are so prevalent.

Into these homes our washing goes, and I have seen it more than once on the sick bed of a tuberculous patient. From these homes negroes come into our homes and, as our servants, are in most intimate contact with us. I know of one man who in the course of two years had three servants who had tuberculosis. He was a doctor and when he heard a suspicious cough had his servants examined, and the tubercle bacilli were found. Most employers, not realizing the danger, would fail to have the examination made.

Most of the negro houses in Savannah are on the outskirts of the city, in or near the district where the drainage is not perfect (this condition here is also being improved at present). The stagnant water in the low ground breeds mosquitoes. I have found in my practice that the negro is not immune to malaria but is moderately susceptible. He therefore is a carrier of this disease as well, and a frequent carrier in my opinion.

Their Hospitals.—It is no surprise to me that the negro is afraid of a hospital. The negro hospitals I have seen are warranted to repel and even terrify people less superstitious than the negro. In Savannah I know of no negro poorhouse, so that the hospitals have to take care of the aged, infirm, paralyzed and blind. As a result they are horribly overcrowded. In the largest colored hospital in Savannah frequently when night comes there are ten or fifteen more patients than beds, and no matter how hot the weather two patients have to sleep in a single bed, and some on the floor or in chairs.

During the six months, April to September, 1914, inclusive, on 667 occasions patients were without individual beds. In April there were only five days on which there were sufficient beds on which to accommodate all the patients. In May, three; in June, six; in July, ten; in August on no day were there sufficient beds. Since August, by the establishing of a house surgeon, and having such surgical patients leave the hospital as could and return for dressings, the wards have been kept from overcrowding as in previous months. In September there were only four days in which all the patients did not have beds, and in October one.

By establishing a negro free out-patient department, and a negro poorhouse the present hospital facilities might be sufficient for a few years more.

The South has a tremendous burden in the negro, and it is remarkable how much is being done with the funds available, but if healthy conditions are to be established here much more must be done.

Their Schools.—Savannah has just completed another modern school building for negroes, but in 1913 out of 10,699 colored children between the age of six and eighteen there was only provisions in the public school for 4,086.

The South, as I have said, is carrying a heavy burden. In Chatham County the tax returns for 1914 show for the whites, $42,508,970.00; the negroes, $1,160,839.00. The taxes paid in by the negroes amount to almost nothing, and he gets an infinitely greater proportion out of the state, county, and city, than he pays into it, and it is claimed by some that we are generous to a point of extravagance with him. Suppose, however, that they were only given their dues. Suppose that we even went further and that as an editorial in the *Columbia State* recommended, the negro not be educated at all until education was brought to the door of every white boy and girl in the state, so that no negro could have any advantage of education over any white no matter how poor the opportunity of the whites had been. Suppose further that this idea was carried out in all the public charities, in the schools, hospitals, poorhouses, district nursing, etc.

Suppose that under such conditions every white had been given every advantage it was possible to give him, the negro none. Can you imagine that a city under such conditions could be a healthy one? Half the population in absolute ignorance; poverty, disease and immorality infinitely worse than they are at present. This would drag the other half down.

No one can deny that such a state of affairs would be bad for a community. It is impossible to keep one half of the community clean, with the other half dirty, one half moral with the other half rotten, one half healthy with the other riddled with disease.

The difference between this imaginary state of affairs and the present is only one of degree, and what is so evidently bad for the community under these exaggerated conditions is bad for it to a less and less extent only as the conditions approach the ideal.

Every dollar spent in improving the conditions of the negro race benefits the whites as well. If the whites and negroes live in the same community

STATISTICS FOR YEAR 1913.

	White, 37,000.		Colored, 42,000.	
	Rate per 100,000.		Rate per 100,000.	
Still-births	48	129.73	230	547.62
RESPIRATORY DISEASES:				
Pneumonia	32	86.48	84	200.00
Broncho pneumonia	6	16.27	16	38.09
Tuberculosis	48	129.73	135	321.42
Whooping-cough	1	2.70	1	2.38
Bronchitis	1	2.70	10	23.80
Influenza	3	8.10	20	47.62
Pleurisy	....	....	2	4.76
Total Respiratory Diseases	139	375.65	498	1185.61

TEN-YEAR INTERVALS.

	Tuberculosis.				Pneumonia.			
	White. Number of deaths.	Colored. Number of deaths.	White. Rate per 100,000.	Colored. Rate per 100,000.	White. Number of deaths.	Colored. Number of deaths.	White. Rate per 100,000.	Colored. Rate per 100,000.
1874–1883	549	975	346.07	610.35	....	....	....	....
1884–1893	543	1,092	277.55	506.99	157	480	80.25	222.85
1894–1903	541	1,333	214.46	499.20	289	653	114.57	238.97
1904–1913	472	1,369	52.41	421.58	379	968	122.33	298.20

the health of the whites cannot improve unless the health of the colored also improves. The health of the negro cannot deteriorate without dragging down the whites.

Selfishness, therefore, even if there were not other motives, demands that the negro be provided with better public charities, better schools, especially industrial schools, better hospitals, and the out-patient departments and visiting nurses that should go with them, better poorhouses or homes for the aged and infirm, and last but not least better laws governing their dwellings and the crowded conditions existing in them.

It will take time to accomplish these advances on account of the large sums of money required to build, equip and run such institutions, but if the absolute necessity of such institutions be constantly impressed on the public their accomplishments will be brought about at a much earlier date.

By themselves the negroes will not better themselves. Where they came from they were savages, left to themselves they remain little better than savages. Their nature is such that benefits such as public charities provide, have to be given to them, almost forced on them. It takes much persuasion to get one into a hospital.

The Japanese are a people of a different type. Already having a high grade of civilization, when brought in contact with our customs, they did not have to be forced on them. Being enterprising they adopted much of ours and in a few decades have equaled and even outstripped us in many ways. The negro in closer contact and with better opportunities remains down.

By the education of the negro he may be made a better citizen, and a more useful member of the community, and come to live in better homes and more healthy surroundings. Instead of being a burden he may come in time to look after himself. This time will be a long time, generations of time. Until this comes to pass it is necessary that the whites, out of their own pockets, in order to protect themselves, furnish the negro with public charities and better public charities than exist at present.

Finally, this paper would fail to accomplish its purpose, if it did not contain a recommendation that increased facilities should be afforded to furnish the negro with better schools and with better hospitals. It must also be recognized that the presence of this inferior race puts a burden on the white race, a burden that must be met with increased appropriations for public health purposes. This must rest on the moral obligation of a higher race to an inferior race dependent upon it; and further on the practical and selfish ground that it is impossible to protect the white people and neglect the black.

PRACTICAL REMEDIAL MEASURES FOR THE IMPROVEMENT OF HYGIENIC CONDITIONS OF THE NEGROES IN THE SOUTH.

M. L. Graves, M. D.,
Galveston, Texas.

Read before the General Sessions, American Public Health Association, Jacksonville, Fla., November 30-December 4, 1914.

The census of 1910 shows that there are 9,827,763 negroes in the United States. This number constitutes 10.7 per cent. of the total population. Of these 7,777,077 are black and 2,050,686 are mulattoes. The latter have been increasing steadily since 1850 and showed the largest percentage of increase during the last decennial period, viz: 20.9 per cent. as compared with 13.2 per cent. in the decennium ending in 1860. These facts would indicate that adultery and miscegenation are still actually on the increase and that post bellum sex immorality is considerably greater with freedom than ante bellum immorality with servitude. It is true the relative increase of the white population during the past ten years is twice as great as that of the negroes, though it must be remembered that immigration is a large factor in the increase of the white population and is of little or no importance in the increase of the negro population.

The distribution of the races makes it plain that there is no practical problem of health in the negro race outside of the South since the North has 98 per cent. of its population white, the West 95.9, while the South has 69.9 per cent. of white population and 31.1 of negro population. There is no geographical division in the United States outside of the South that has as many as 3 per cent. of negroes in its population. Two of the Southern states, viz.: Mississippi and South Carolina, have a negro population of more than 50 per cent. of the total population, while Georgia follows with 45.1 per cent., Louisiana 43.1 per cent., Alabama 42.5 per cent., Florida 41 per cent., Virginia 32.6 per cent. and North Carolina 31.6 per cent. The seventeen states which may be classed as Southern in geographical distribution, according to the census, show 8,749,427 negroes in their population.

The percentage of increase in the negro population in the last decennium is a little less than in the preceding one though the total number of negroes is considerably increased. The percentage of increase in the last ten years was 10.4 per cent. as against 24.4 per cent. for the whites. It is further interesting to note that of the 9,827,163 negroes in the United States 7,138,534 live in the country and are classed as rural, while 2,689,229 live in the cities and are classed as urban; and these facts must be remembered in suggesting efforts for improving their hygienic condition.

Among the cities of the South, Washington, D. C., leads with a total negro population of 94,446, while New Orleans is a close second with 89,262. Very few of the other Southern cities reach the 50,000 mark in the negro population.

From the negro Year Book of 1913 issued at the Tuskegee Institute and edited by Monroe N. Work, I learn that the death-rate among negroes in the South is 24 to 1000 and the average duration of life about 35 years. He states that 450,000 negroes in the South are seriously ill all the time and lose 18 days per year from work for every inhabitant, entailing an estimated economic loss of $75,000,000 annually. Of these constantly sick ones 112,000 are workers and 225,000 of the sick die annually, with an aggregate funeral expense of $15,000,000. He believes that 45 per cent. of these deaths may be readily prevented. This interesting pamphlet also asserts that $300,000,000 is the economic loss to the South from sickness and death among its negroes alone and that it would pay the South to expend $100,000,000 annually in improving the health conditions of the race.

Now, I am asked to suggest practical remedial measures to improve conditions responsible for the morbidity and mortality among our negro population. "Practical" is frequently a difficult term to define and may mean a different thing to different minds. But usually we understand by it something workable, something capable of application or execution; and in order to meet this definition it must appeal to the common sense of intelligent and informed men. Moreover, a plan may be easily utilizable for temporary, small results, while years of patient work may be necessary to lay the foundation for a great or successful undertaking. Waiving innumerable suggestions that might be made, I beg to call your attention to the following important factors in prosecuting so large a problem as the one assigned to me to a successful conclusion.

(1) *A National Department of Public Health in the United States Government* which shall control all the operations for public health anywhere within its borders: Some such organization as is embodied in the Owen Bill before the United States Senate, which shall organize, collect, coördinate and direct all the agencies for the public health in the United States. I am told that every ism and organism of irregular medicine, every cult and order of pseudo-science, religious and otherwise, is actively organized and arrayed against such a proposition.

In a recent conversation with Congressman Henry, chairman of the Rules Committee of the House of Representatives, he told me that within a week following the introduction of his resolution providing for the creation of a permanent Committee in the House on Public Health, he received a thousand letters from those interested in opposing it. For myself, born and raised in the South, and impregnated with the ideas of State Rights, I am firmly convinced that when it comes to sufficient and efficient protection of the public health it will require the powers of the National Government to do it. Political myths and party shibboleths should no longer be permitted to retard our progress and cause such enormous waste of valuable lives and the economic loss from preventable illness and death.

At my home city at the entrance of a great port of the United States stands a state quarantine department, insufficient and unable to properly safeguard the public health, in active and sole control of the port quarantine, while the United States Government just across the channel maintains a large number of empty hospital pavilions ready and waiting for service because the state of Texas has not yet learned that the Federal Government is the only agency in this country capable of meeting such a responsibility. Twice within the last decade the city of New Orleans has called upon the Federal authority to stem the tide of dreadful infections, and San Francisco has sent its Macedonian cry to Washington for help when *Bacillus pestis* invaded the Western coast. Defects in local and state control of dangerous diseases was witnessed, in striking manner, a few years since in the case of the leper Early. Three or four states played battledore and shuttle-cock with this afflicted man, and the newspapers were full of sensational accounts of indignant and frightened citizens inflicting their own quarantines to the disgrace of our public health service.

The last leper I saw was a public prostitute from Louisiana who probably contracted her disease in Mexico and, if we are to believe Prince A. Morrow's theory of the conveyance, she may have left behind her a string of incubating lepers from New Orleans to Chihuahua. Our methods of communication and conveyance are now so multiplied and our points of contact so numerous that state borders are no longer able to afford protection from epidemic or sporadic cases of communicable disease. As proof of this we have only to recall the periodic recurrences of smallpox, the widespread occurrence of hookworm and of pellagra and the present serious epidemic of foot and mouth disease in the cattle of the country.

Our local state, county and municipal health departments throughout the South are often inefficient because of political appointments with neither education, experience nor professional fitness to be entrusted with such responsibility. When we contemplate the efficiency of the National banks and their regulation by the Federal Government; when we consider the respect and fear in which our Federal courts are held by wrong-doers everywhere, it is no wonder our minds turn to the National Government for protection of the health and economic efficiency of our people.

(2) *Private philanthropy to finance a Commission of Research* among the negroes of the South to improve health conditions. It is certain that com-

mittees or commissions unpaid and without authority, whether appointed by social or medical organizations, will accomplish nothing. There must be a thorough organization with well-trained and capable men put into the field, and for such services considerable sums of money must be expended. The great work already done by the Hookworm and Pellagra Commissions, both made possible by generous donations of citizens interested in the public health, should inspire some other wealthy man or woman to go and do likewise and organize a Research Commission to study health problems among the negroes of the South. I could hope that such a philanthropic spirit may be found among the sons or daughters of the South.

(3) *The enlargement and encouragement of the educational efforts of the institutions of the colored people* throughout the country, such as Tuskegee, Hampton, Wilburforce University, and Payne and Layne Colleges, Straight and Southern Universities, etc. Each of these institutions is doing a useful work among its people, and coöperation of bodies like this with suggestions and practical help would no doubt be gratefully received.

(4) *The inauguration of public health and preventive medicine courses of instruction* and degrees in every medical college of importance throughout the country, so that an educated and trained body of sanitarians may be supplied to states and counties and cities for their health officers. Until such a system exists neither the white nor the negro races will receive a tithe of protective value of government control of the health to which they are entitled. The efforts of the American Medical Association, the American Public Health Association and of state societies and health boards to educate the public and to put lecturers in the field is a step in the right direction; but few of these persons are trained to speak with authority on public health matters and they can neither arouse the interest nor secure the active support of the public. Men must know what to say and what to do, and when this trained service is rendered to the public and results become apparent, then the leaven will begin to leaven the whole lump of our citizenry.

(5) *The organization of efficient state, county and municipal health departments* with every modern laboratory equipment and with well-trained, well-paid and full-time health officers in charge of same not subject to political removal.

(6) *Collaboration with churches and social welfare workers* everywhere in the newer movements looking to the welfare of the race. The churches are ready and anxious to join in this service; their pulpits, their pastors, and their congregations may be utilized fully. They must, however, be furnished with simple, scientific and useful information. The colored preachers and their congregations and associations can be depended upon for their full support and coöperation.

(7) *The public schools with the active assistance and direction of the school physicians and the teachers* may be made a most useful agent in the dissemination of health education. Booker T. Washington advises me that "In recent years there has been a great awakening on the part of colored doctors, preachers and teachers with reference to improving the health of the negroes and there will be no difficulty in securing their coöperation." Public health lectures illustrated by lantern slides and moving pictures may be made to draw large audiences in our colored churches and schools, and educational propaganda of the greatest importance undertaken and carried to a successful conclusion.

The negro race is well nigh wholly deficient in a knowledge of the elementary rules of hygiene and sanitation, both in the cities and in the country districts, and properly conducted educational efforts on ventilation, sewerage, water supply, bathing, the care of milk, and other foods, and the simpler methods of conveyance of communicable disease, would meet with intelligent reception when presented in this way.

The venereal peril will be perhaps the most difficult problem to handle, and yet I am persuaded that the right kind of information given by thoroughly informed men in a suitable manner must be productive of great good. Investigations should be made by our scientific institutions with our newer methods of blood examinations, such as Wassermann, Naguchi, and the gonococcus fixation test to determine the actual facts about these infections, and present them in an intelligent way to both races. The Department of Clinical Pathology of the University of Texas is now engaged in testing out one of these infections in all colored patients admitted to the wards of its service. It must be admitted here that our white population is constantly menaced by illness among the negroes, and we have never interested ourselves sufficiently in the servant quarters and habits. Infections like syphilis, tuberculosis, malaria and others are constantly being conveyed from negroes to white persons directly.

(8) Too much stress can hardly be put upon the necessity of *appeals to landlords throughout the country and in the cities* to improve living conditions among the negroes. Principal Washington tells me that 75 per cent. of the negro families of the South live in rented houses, and all of us know that many of these are poorly constructed, insufficiently lighted, and provided with only the crudest bathing or sewerage facilities, and often situated along the creeks and low places where the water stands and stagnates, where insects breed and thrive, and in the cities too frequently near the dumping grounds of city trash and filth, where flies and mosquitoes and other insects propagate and convey infection to the negro servants who in turn communicate it to the whites for whom they labor. There are many cities throughout the country where sewers, lights, water supply and other necessary sanitary measures are not carried to the poorer quarters of the

negroes on account of the cost, and it is incumbent on those interested in the public health to see that they secure a square deal in this respect, and if for no other reason, the selfish one of self-preservation may be invoked to stir us to activity. The health of the white people of the South is dependent upon the health of the negroes of the South and the sooner this fact is recognized and acted upon, the sooner and more certainly will our health conditions improve.

Disfranchised and unable, by lack of education or personal knowledge, to protect themselves or to secure readily these benefits of a larger and better civilization, is it not the duty of thoughtful and just white citizens of this country to see that these necessary measures for the protection of the public health are secured.

SYPHILIS AMONG INSANE NEGROES.

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Pathologist, Georgia State Sanitarium, Milledgeville, Ga.

Read before the General Sessions, American Public Health Association, Jacksonville, Fla., November 30–December 4, 1914.

In discussing the subject of syphilis among insane negroes, it is necessary to refer to the prevalence of this disease in all races, and especially in the negro race as a whole, so I hope you will pardon the many references that I shall quote to emphasize the importance of this particular subject in a general way.

Until a few years ago syphilis in the negro had received but little attention from medical men and health officials, and at the present time is not regarded as important as it should be. This is, in a great measure, due to the lack of accurate statistics on the frequency with which the disease occurs in the negro; and also due to the rather poor facilities (or lack of the same) that are offered the negro in the South for receiving treatment in hospitals and at free dispensaries.

Three fourths, or over, of the entire negro population is in the South Atlantic and East South Central States, embracing the District of Columbia and twelve states, and until recently the majority of these states were outside the registration area for deaths as prescribed by the United States Census Bureau; consequently, accurate data as to the actual causes of death in the negro race is not available except in a few states and some of the larger cities.

I am supplementing this paper with a tabulated report of the number of deaths from syphilis in both the white and negro race for the last five years within the registration area. These reports were kindly furnished me by Director W. J. Harris, and Acting Director Austin of the Census Bureau. (See page 221.)

Complete morbidity statistics are lacking in many states and cities, other than those of the South. This is especially true of the latter regarding disease in the negro.

Syphilis, according to Trask,* is a reportable disease in only six states and very few of the larger cities.

With the above facts in view, the importance of gathering accurate mortality and morbidity statistics in the South cannot be over-estimated, especially if we expect to study intelligently the diseases most prevalent in the negro.

Some data and personal observations that I wish to present to you will, I hope, more forcibly emphasize what I have to say regarding general paralysis and syphilis in the negro race.

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* Trask, A Discussion of Vital Statistics; Supplement No. 12, U. S. Public Health Reports, April 3, 1914.

Murrell, of Richmond, Va.,* was one of the first, if not the first, to call attention to the prevalence of syphilis in the negroes of the South, and he predicted that in another fifty years an unsyphilitic negro would be a rarity. This, in my opinion, is not the view of an extremist, especially when we consider that the large majority of the population is of the carefree class who do not even attempt to prevent any disease; add to these the intelligent and educated class who will assume the same risks that a large proportion of the whites do and you have about 95 per cent. of the negro race who are most likely to contract syphilis or other venereal diseases.

Murrell further emphasizes the difficulty met with in getting a syphilitic negro to take treatment. Anyone present who has ever attempted to treat one can attest to that fact, I am sure. And insufficient treatment of any case of syphilis, as we well know, means in all likelihood a central nervous involvement followed by general paralysis, tabes, etc.

Inherited syphilis and its possible effects for several generations cannot be too forcibly brought to your attention, and a recent article by Stoll † emphasizes this point very strongly. In an examination of 68 individuals; 33 apparently healthy and 35 with obvious ailment, he found that 39 per cent. of the former gave a positive luetin test, while 88 per cent. of the latter gave either a positive Wassermann or luetin.

Jeans and Butler ‡ in an article on "Hereditary Syphilis in Children" emphasize the following: That hereditary syphilis is more frequent in illegitimate than legitimate children, and also in St. Louis, syphilis is from two to three times as frequent in the colored as in the white race.

It is hardly necessary here to call attention to the fact that a large number of negro children are illegitimate. Murrell, Hazen, and others have emphasized this particular point in its relation to the prevalence of syphilis in the negro race.

There is no means by which we can ascertain the number of already defective negroes who may have engrafted upon these defects the influence of ancestral syphilis; they are undoubtedly numerous as evidenced by the number of negroes confined in asylums and prisons of the South, together with those we meet in civil life who show unmistakable stigmata, both physical and mental, that medical science has taught us to attribute to syphilis.

Green, § in a very recent article, in which he compares the frequency of the different psychoses in the white and negro races, and based on the admissions for five years at the Georgia State Sanitarium, shows that the senile types are nearly 3 per cent. higher in the negro; that the manic depressive type exceeds the same type in the whites by practically 6 per cent.; and while the negro shows 7.3 per cent. general paralysis, the white patients showed only 3.1 per cent. These percentages are based on a total admission of 5,410 for the five years, 2,119 of those being negroes and many of the latter being from the rural districts. The following percentages for paresis as to the sex and race for the five years, are also interesting and significant: White males 4.5 per cent., white females 1.2 per cent.; negro males 10.2 per cent., and negro females 4.2 per cent.

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* Murrell, Syphilis in the American Negro; J. A. M. A., March 12, 1910, No. 11, Vol. 54.

† Stoll, The Late Manifestations of Inherited Syphilis, etc., J. A. M. A., October 31, 1914, No. 18, Vol. 63.

‡ Jeans and Butler, Hereditary Syphilis as a Social Problem; Amer. Journal Diseases of Children, November, 1914, No. 5, Vol. 8.

§ Green, Psychoses in Negroes—A Comparative Study; Journal of Nervous and Mental Diseases, November, 1914, No. 11, Vol. 41.

Hazen, in a very recent article* shows that out of the total admissions to Freedmen's Hospital, District of Columbia, for 11 years, there were admitted 30,021 negroes and of that number 881 or 2.26 per cent. were admitted for syphilis against 92 or 4.35 per cent. out of 2,160 whites during the same period. While the negro seems to have the best showing here, and also apparently an equal or slightly higher percentage in other figures quoted by Hazen, I think it should be recognized that a higher average of intelligence and knowledge exists in the negroes of Washington than in those of other localities. Furthermore, a reference to the Census Bureau's tabulated report shows that the negro death-rate from syphilis in Washington, for the years 1910, 11, 12 and 13, exceeded the white deaths in actual numbers, practically twice as many negroes (or colored) dying from syphilis in 1913.

Hazen gives other figures which are very significant to me and which emphasize particularly what I wish to bring out regarding the latent effects of syphilis and insufficient treatment in the negro. In a personal study of over 2,000 consecutive cases of skin diseases in the negro race and an equal number in whites, he observed the following types and proportions of syphilis in the following respective numbers:

	White patients.	Negro patients.
Secondary	22	68
Tertiary	12	39
Gumma	14	80
Hereditary	10	42

Other figures for other types of the disease are given in this series but are of minor importance here.

These figures, as given by Hazen, show that there is apparently much untreated syphilis among negroes, and these observations alone should stimulate a further study of this disease in the negro race, and especially in the larger cities of the South.

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* Hazen, Syphilis in the American Negro; J. A. M. A., August 8, 1914, No. 6, Vol. 63.

DEATHS AMONG WHITE AND COLORED POPULATION FROM SYPHILIS.

State and City.	Per cent. of population, April 15, 1913.		White.										Colored.									
			Number of deaths.					Death-rate per 100,000 population.					Number of deaths.					Death-Rate per 100,000 population.				
	White	Col'd.	1909	1910	1911	1912	1913	1909	1910	1911	1912	1913	1909	1910	1911	1912	1913	1909	1910	1911	1912	1913
Kentucky	88.6	11.4	*2	*2	66	56	70	*2	*2	3.2	2.7	3.4	*1	*1	74	74	60	*1	*1	28.1	27.9	22.5
Maryland	82.0	18.0	32	43	75	90	73	3.0	4.0	7.0	8.3	6.7	48	50	62	72	73	20.6	21.5	26.5	30.4	30.5
North Carolina†	64.8	35.2	*2	8	14	13	17	*2	3.4	5.8	5.2	6.6	*1	23	33	28	36	*1	18.1	25.0	20.6	25.8
Virginia	67.4	32.6	*2	*2	*2	*2	58	*2	*2	*2	*2	4.0	*1	*1	*1	*1	148	*1	*1	*1	*1	21.3
Cities of 100,000 population or over in 1910																						
Birmingham, Ala.	60.6	39.4	3	3	5	3	6	7.1	3.7	6.1	3.3	6.3	10	40	34	46	39	35.9	76.1	63.3	77.6	62.5
Washington, D. C.	71.3	28.7	17	13	21	13	20	7.3	5.5	8.7	5.3	8.1	15	25	22	24	41	15.9	26.3	22.7	24.4	41.1
Atlanta, Ga.	66.4	33.6	3	3	—	3	12	3.3	2.9	—	2.7	10.4	5	2	10	4	13	10.8	3.8	18.6	7.1	22.3
Louisville, Ky.	81.9	18.1	3	7	7	9	16	1.6	3.8	3.8	4.8	8.4	3	12	11	11	5	7.4	29.6	26.7	26.5	11.8
New Orleans, La.	73.6	26.4	26	21	32	34	30	10.6	8.4	12.6	13.2	11.5	15	23	42	29	44	16.9	25.6	46.0	31.3	46.7
Baltimore, Md.	84.8	15.2	21	36	66	72	54	4.5	7.6	13.8	14.9	11.1	28	33	34	43	52	33.1	38.7	39.5	49.5	59.4
Memphis, Tenn.	59.9	40.1	7	3	6	15	12	10.1	3.8	7.5	18.2	14.3	9	4	14	16	16	18.9	7.6	26.3	29.1	28.5
Nashville, Tenn.	66.9	33.1	4	5	3	4	6	5.5	6.8	4.0	5.3	7.9	8	9	14	12	9	21.9	24.6	38.0	32.2	23.9
Richmond, Va.	63.4	36.6	6	7	13	11	13	8.2	8.6	15.9	13.2	15.4	16	33	26	24	25	37.5	70.5	54.9	49.8	51.2

* Not admitted to registration area until a late date.

† Includes only municipalities having a population of 1,000 or over in 1900.

During the year 1910, 4,384 negroes and 39,629 native born whites were admitted to the insane asylums of the U. S.; 4.9 per cent. or 216 of the negroes were general pareties; 2,618 or 6.6 per cent. of the whites were general pareties.

Hazen, in a study of 2,000 consecutive cases of skin diseases in the negro and an equal number of whites, found over three times as much secondary, and tertiary syphilis in the negro. He also found nearly six times as many gumma, and over four times as much hereditary syphilis in the negro.

Dr. Dunbar Roy, of Atlanta,* says that "It is surprising the amount of nose and throat syphilis you find among the negroes of Atlanta."

DuBose,† in a recent article in the *Southern Medical Journal*, calls attention to the lack of hospitals for negroes in the South, and emphasizes the high death-rate from syphilis and tuberculosis among them; he says, "Their indisposition is more physical than temperamental."

According to the tabulated report furnished me by the Census Bureau, and figures given by Trask in a discussion of vital statistics,[2] the number of deaths from syphilis in Birmingham during 1912 were 46 in the negro race, while for the entire population during the same period, 14 deaths occurred from diphtheria, 9 deaths from measles, and 56 deaths due to typhoid fever. For the same period in Richmond, Va., 24 negroes died from syphilis, while the deaths from diphtheria, measles, and typhoid fever, for the entire population were 8, 1, and 22 respectively. The entire state of Maryland in 1912 had 20 deaths from measles and 229 deaths from typhoid fever, while the city of Baltimore had 43 negro deaths from syphilis against 72 white deaths from the same disease and Baltimore's negro population is only slightly over 15 per cent. of the total according to the 1910 Census.

These figures further emphasize the high death-rate from syphilis in the negro, and even if we take into consideration the acute character of diphtheria, measles, and typhoid fever, we still must admit that this is a very poor showing for the negro, because we take every precaution known to medicine and sanitary science to prevent the latter diseases in the negro as well as the white man, yet we are doing practically nothing to prevent syphilis in either.

In a personal communication from Dr. Lynch, Professor of Pathology in the Medical College of South Carolina, he has given me permission to quote some conclusions arrived at by him in a comparative study of a large number of negroes with the aid of the Wassermann reaction and the blood pressure apparatus. These conclusions are as follows:

"1. Syphilis occurs in from 50 per cent. to 60 per cent. of the major class of our Southern negroes.

"2. It is more frequent in the women than in the men.

"3. By comparison of blood pressure and Wassermann reaction there seems to be no relationship between high pressure and positive Wassermann.

"4. The ravages of the disease were not severe in the individual of this series.

"5. Single miscarriages and still-births are not apparently more frequent in the syphilitic than in the non-syphilitic, but the habit of miscarrying is much more prominent in the former.

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* Roy, See page 1568, J. A. M. A., same as No. 3.

† DuBose, The Condition of the Negro in the South; Southern Medical Journal, November, 1914, No. 11, Vol. 7.

"6. Syphilitic women are not as fertile as the non-syphilitic and their children do not survive as well as those of the latter."

The 1910 Census of Insane and Feeble-Minded Institutions of this country showed that on January 1, 1910, there were in the insane asylums 12,910 negro inmates, and that over 8,000 were between the ages of 20 and 54 years, the period in life when we would most expect manifestations from central nervous lesions of syphilitic origin.

During the same year 4,384 negroes were admitted to insane asylums, and over 3,000 of this number were 20 to 54 years of age. Now, during the same period 4,127 cases of general paralysis all colors, were admitted, and of this number 216 or 4.9 per cent. were negroes as compared to 2,618 cases, or 6.6 per cent. in the whites, and the latter percentage is figured from 39,629 native born whites.

I have personally made routine Wassermanns on all patients admitted to the Georgia State Sanitarium from January 1 to November 15, this year, and the following results further emphasize the prevalence of syphilis in the negro. Eleven hundred and ninety-four patients were admitted during this period: 420 white males with over 6 per cent. positive Wassermanns; 351 white females with over 5 per cent. positive; 255 negro males with over 16 per cent. positive; and 218 negro females with over 16 per cent. positive Wassermanns. Here is practically three times as much syphilis in the negro as in the white and confirms the observations made by others. All Wassermanns here reported are clean-cut positives showing complete inhibition of hemolysis. Weak or doubtful ones are omitted.

Twenty-two of the negroes and fourteen of the whites were general paretics, the diagnosis being confirmed by Wassermanns, cytological examinations, gold chloride tests of the cerebro-spinal fluid and also by the opinion of the entire staff.

Ivey,* in a Wassermann survey of over 600 negro patients in the Mt. Vernon Insane Hospital of Alabama, found over 25 per cent. positive in the males and over 27 per cent. positive in the females.

Doctor Terry,† of Jacksonville, in discussing the negro as a public health problem before the Southern Medical Association last year, gives figures which show that the average death-rate from venereal diseases in this city for five years (1908 to 1912) was six times greater than in the whites for the same period.

To quote Doctor Terry's conclusion in the above paper which is very appropriate and applicable here: "The burden of this great health problem must devolve finally upon the Southern sanitarian and sociologist. It has, I believe, been sadly neglected by us all in the past and yet it is most intimately concerned with the welfare of the entire South; accurate observations, careful social surveys, experimental methods must all play a part. No field is probably so barren of sanitary achievement as this and none offers a more worthy occasion for painstaking effort with promise of far reaching results of the utmost import to the Southern states."

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* Ivey, The Wassermann in Insane Negroes; Medical Record, October 18, 1913.

† Terry, The Negro, A Public Health Problem; Southern Medical Journal, June, 1914, No. 6, Vol. 7.

Personally I have no particular or special remedy to offer as a solution of the syphilis problem in the negro race, however I hope the data and statistics which I have given you will awaken new interest in this all important subject, and that this Association, as a national organization, will recognize that syphilis as a cause of insanity in the negro race (as well as the white) is rapidly becoming one of the most important public health questions in the South. It is a question that we cannot overlook, and we owe it to this race and ourselves for both economic and sociologic reasons, if for no other, to do more for these unfortunates in education on public health problems, and to see that better facilities are offered them in the way of treatment.

THE RELATION OF PUBLIC HEALTH NURSING TO THE PUBLIC HEALTH CAMPAIGN.

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The social standards of society, as we know them today, have been growing through many centuries out of four or five stages of charitable impulse. These stages can be fairly well indicated as follows:

1. To relieve distress;
2. To give adequate relief;
3. To restore self-support;
4. To prevent untoward conditions in general and sickness in particular;
5. To reconstruct society on a conscious social basis.

There has always been some recognized exponent or agent of these organized efforts toward human betterment. For instance, the deaconesses of the early church; the monastic, the military, the secular orders of the twelfth to seventeenth centuries inclusive, whose activities culminated in the extraordinarily clear and practical pronouncements of principles and programs of relief set forth by St. Vincent de Paul, which still form the basis of much of our best modern effort; and in our own times, the well-known German scheme of voluntary friendly service, which was conceived and practised unto the one great end of preserving self-respect through restoration of self-support without resort to public funds.

In all of these, the care of the sick and injured has ever been a constant and important part. No other misery was more wretched, no other need of relief greater than that due to physical ills. Therefore, the office of nurse is an old and honorable one and has become an integral part of all missions of alleviation, whether in hospital or home. She, too, has partaken of the same actuating motives that controlled other servants of humanity.

For the purposes of this discussion, we shall confine ourselves to the work of the extra-mural nurse, who visited the needy sick in their homes, relieving the suffering and curing the ills she found in so far as lay in her power.

As long as the causes of misery were quite generally regarded to be only two: *i. e.*, poverty and drink, and at the same time poverty was considered inevitable and the drink habit incurable, the nurse had little or no incentive to do more than relieve where she could and pass on to the next victim. She neither searched for nor saw any relation between her patient's physical ills and his living or working conditions; she thought little or nothing of the possible effect of his disease upon his family and neighbors; it seldom occurred to her to look to other than "the will of God" for an explanation. Yet in this the nurse was not peculiar. Medical science was very far from exact—the medical profession could give but little light on the origin of disease; its practice consisted largely in treating symptoms rather than causes, and the nurse had no alternative but to carry out orders.

Gradually, however, physicians and chemists and bacteriologists such as Jenner, Pasteur, Koch, Lister, Flexner, and Carrell, gave to the world their marvellous discoveries of bacterial life. The causes and sources of some of the worst scourges were found and the means alike of cure and prevention were established in the vaccines and anti-toxins and serums. No longer was the human race to be held at the mercy of smallpox, of hydrophobia, of diphtheria, of tuberculosis, of malaria, of yellow fever, of typhoid fever—even the bubonic plague and Asiatic cholera and anthrax had come under some measure of control.

Here, then, was presented a wholly new aspect to the nurse's mission, an entirely new motive for the pursuit of her work, which came to her along with the whole civilized world. Thoughtful people were thrilled with these new messages of increased expectation of life. Almost immediately scientists, physicians and nurses, city and state departments of health began to turn their attention more to prevention than to cure. Everyone commenced to think and to work in terms of health rather than sickness, and with measurements of community rather than individual health. It was not enough for scientists to hold in their keeping these new storehouses of knowledge. Their findings must be interpreted into terms of laws and ordinances—administrative machinery must be constructed and set up to carry into effect these beneficent protections to human life.

All of these steps were taken first in response to the call to wipe out the great white plague. New laws were enacted, new ordinances were passed, new appropriations were made, new departments and laboratories were established, new hospitals and sanatoria and other institutions were built and equipped. But still one indispensable factor was lacking—and that was an interpreter of this new-found knowledge and recently made laws.

Scientific knowledge in scientific terms does not greatly increase the popular intelligence regarding the means of prevention of disease. It must be translated into the simplest terms—nay, more, it must be taught by demonstration, patient, painstaking, oft-repeated demonstration. Florence Nightingale said years ago: "The only word that sticks is the word that follows work." So, when the scientists and physicians, the law-makers and the law administrators began to look about for this last essential agent in their great program of health protection, they promptly said that there are district or visiting nurses in many of our cities, going in and out of the homes of the people. Their entré is assured, their service is welcome, their friendship is accepted, their advice is trusted, their injunctions are heeded. We can employ them to do our work, to carry our message, and in the past this is what they did. The service of the visiting nurse was demanded as never before. To her technical training was hurriedly added some special knowledge of the disease and its treatment which she needed to make her both an intelligent student and teacher of the conditions that would confront her. By degrees, it became evident to herself and to other people that she needed much more preparation if she were to adequately fulfill her function in this one great movement against tuberculosis. One by one they found she must know the public health laws and ordinances, the local and state agencies on which she could and should call for direction or assistance in questions of housing, sanitation, food and milk and water supply and protection, poor relief, custodial and correctional care. She must know how to be an intelligent applicant for the services of these bureaus and various philanthropic agencies. In fact, she had to become a good diagnostician of social and economic conditions of the families to whom she went.

What has been said of the campaign against tuberculosis and the nurse as a factor in it, must be reiterated with even greater emphasis when we turn our attention to that farther reaching and vastly more hopeful movement, known as school-hygiene. Those of us who think of it in terms of medical inspection and school nursing, need to view it in its larger aspects. Although the early conception of it could be summed up in two words, "health police," it now starts far back of the child himself. It includes the construction of the building; the provision for heating and lighting and ventilation; the seats and desks; the blackboards—their character and location; the provisions for baths and gymnasiums. It takes into account the drinking fountains, toilet facilities and cloak rooms; the methods of and times for janitor service. It considers the kind of paper that shall be used in text-books and the width of their columns and many other matters of equal importance. Then, having done what it could to make the building and its equipment serve the child's best interest, it turns its attention to his personal well-being.

The first idea of meeting this need was to provide medical inspectors, who would not only detect as early as possible and exclude children suffering with communicable diseases, but would examine all the children and send written messages to parents telling them of their child's physical defects and urging them to have them treated by the family physician. This experiment was watched with much interest and results were eagerly waited for, but when those results were tabulated the returns were sadly disappointing. For example, it was found in New York City where the service had its origin (so far as the United States is concerned) under most favorable conditions, that only 6 per cent. of the instructions sent home by the physicians were heeded. This meant practically 94 per cent. waste of public money appropriated for an indisputably important cause.

It must not be given up; but to hold it, it must be radically improved. What was the remedy?

The answer came, as it had to the tuberculosis workers. A follow-up agent is the solution of our problem, and the public health nurse is naturally and logically that agent. Again, new scientific studies, new laws and ordinances and appropriations, new administrative machinery were insufficient because incomplete without this indispensable factor of interpretation of the social conscience, which was trying to serve the public, but could not serve without the public's coöperation—and coöperation naturally would not be granted until the people could understand.

With the introduction of the nurse into the program of school hygiene various things happened; for example, first, as compared with 6 per cent. of the instructions from physicians being carried out in New York City, the reports a few years later showed 84 per cent.; and whereas prior to the advent of the school nurse, 57,000 children had been excluded in the same length of time. Second, the home visits brought to light countless conditions of similar nature in the children of pre-school age, which offered quite as strong a claim on the public as did the ills of the child of school age. Third, the increased staff made possible routine inspections by the nurses at frequent intervals as a valuable supplement of the medical examinations, resulting in more effective work and a larger scope of work.

Here again, however, the nurse was inadequately prepared for this new demand, which gradually, for the first time in the history of nursing so far as can be ascertained, assumed the proportions of some minor functions of the physician, actually forced upon her by physicians themselves, first in small towns where the doctors were called upon to do gratuitous work for the schools (because the community could not afford to employ both doctor and a nurse) and later in several larger cities. Nurses were loath to assume these added duties against which they had been warned and enjoined for many years. Although to the practitioner of medicine they were insignificant indeed, when assumed by a nurse they became a serious responsibility.

To meet it, she must devote herself diligently to special study. She found her knowledge acquired in the training school of minor eye and skin conditions, contagious diseases and oral and orthopedic affections, utterly inadequate. So in place of the books and lectures and conference programs on tuberculosis, the school nurse applied herself to studies that would most quickly and satisfactorily fit her for work among children.

Departments of health and education, employing school nurses, have done much to make such study possible along with the day's work, while some women have spent considerable time in postgraduate courses—including theory and practice—for the sake of qualifying for the largest possibilities of this greatest of all public health movements.

As has been suggested, the home visits of the nurses discovered similar ills in the children of pre-school age, which they were eager to care for. Moreover, when the parents saw the benefits derived from the treatment of the older children, they clamored for the same for the younger ones. And, third, when to the students of social and public health problems and to departments of health and education and to bureaus of estimate and apportionment and to taxpayers, it had been conclusively demonstrated that the returns for the school hygiene appropriations were not only better physical beings, but that numberless mental and moral handicaps were removed, that laggards were able to do standard work, that the cost of repeaters was thereby proportionately reduced, they added their sanction to the voice of the people and of all school nurses and provided for the service now known throughout the world as infant welfare.

Here again, as in tuberculosis and school hygiene, the life of the infant was found to reach far outside the home. Its claims for life and health led directly into the domains of sanitary inspection of milk and water supply and of housing codes; it made new claims on parks and playgrounds; it called for distributing centers of safe milk and free ice; for babies' clinics and open-air camps and hospitals; for mothers' conferences and little mothers' classes.

Once more it was found that sanitarians and physicians and nurses together could not get at the root of the evil until some one followed the mothers to their homes and there interpreted, by demonstration, the instructions given in the milk station or class room or conference. It was the lesson in the care and modification of milk with the utensils which the mother herself must use that insured her understanding of the doctor's directions. It was the repeated visits of the nurse that kept up the mother's enthusiasm sufficiently to overcome her weariness or the indifference and incredulity of her neighbors. It was the opportunity gained by these frequent calls that made it possible to impart the larger lessons of regular feedings and regular sleep, of fresh air and sunshine, of daily baths and correct clothing—in short, of the hygiene of infancy and indirectly the hygiene of personal and home life for *all* the family.

Again the nurse was chosen to round out this program of health protection and education. Here, she immediately found herself involved in the inexhaustible problem of unlicensed midwifery and preventable blindness; of prenatal influence reaching from the laws of heredity to the mother's knowledge of and ability to practice the hygiene of pregnancy—vexed questions indeed, which obstetricians and eugenists and biologists and psychologists have been studying and all have agreed that prenatal care is an indivisible part of infant welfare propaganda. In consequence, prenatal nursing and prenatal clinics and mothers' schools have been organized—these in far less numbers as yet—but all serving to show the direction of effort dictated by the newly awakened social consciousness and conscience. In fact, about forty such enterprises are now in operation in the United States, though there are not as yet to our credit any laws commensurate with those of Germany, France and England, restricting the labor of and providing pensions for pregnant and puerperal women.

Once more the nurse's education has been found deficient. To be expert in this special work, she needed to add materially to her limited knowledge of infant life, its ills and dangers, regimen and care. But with both a woman's and a nurse's instinctive response to the appeal of infancy, she quickly availed herself of lecture courses, class instruction, new books and clinical opportunities, which would round out her technical training and fit her for infant welfare work.

These three great movements, represented as they are by national and international conferences, express the world's largest demand on public health nurses; but there are other developments which claim our serious attention, chief of which are industrial welfare work and medical social service. For a number of years managers of large industrial plants have become increasingly conscious that the health and general well-being of their employees is a valuable asset, and to that end have introduced many so-called welfare propaganda, such as hot lunches, rest and reading rooms, baths, club houses, educational classes, hospitals, medical inspectors and visiting nurses. Many who have not granted the value of the foregoing have voluntarily installed safety devices and established one form or another of insurance to cover sickness and accident benefits and loan funds. To the latter much impetus has been given by safety commissions and "safety first" campaigns, while workmen's compensation and employers' liability acts have rendered obligatory great advances in the protection of laborers against industrial hazards. Within the current year a National Council on Industrial Safety has been organized and has already placed much to its credit on "the ledger of human balances."

While no reliable figures are available, it is rather generally conceded that no single factor in this significant movement has accumulated more definite or prompt results than the visiting nurse, whose work in most instances is by no means confined to the shops or stores or mines or mills, but follows the worker to his home and includes the family in its care. Even this family service is given at the company's expense, for some employers have proven to their satisfaction that such an outlay *is fully* justified by the returns.

Again, however, we are obliged to acknowledge that the nurse called to this kind of work has been quite unfamiliar with industrial and economic questions, such as workmen's compensation and employers' liability laws, industrial hazards, safety appliances, the laws governing sanitation, fire protection and other labor conditions, all of which are more or less directly connected with her service. Consequently, her usefulness has been on the whole gauged by her ability and desire to understand, in some measure at least, these controlling elements of industry and commerce. She too, then, must be given opportunity for some special postgraduate study.

One more specialized form of public health nursing must have mention here. In these days of efficiency requirement (which definitely includes the question of economy), in these days of preventive medicine, physicians and managers of hospitals, dispensaries and clinics have clearly recognized the need of a medical social service agent, trained to supply the social diagnosis on which the clinical one very often rests, and to provide social treatment which frequently becomes an important factor in effecting a complete and permanent cure.

Although organized medical social service is hardly more than six years old in America, it has become an integral factor in many hospitals, dispensaries and similar institutions, and others are constantly organizing such departments. Perhaps more than in other fields the nurse's worth in comparison with that of the lay social worker has been contested. Her technical training has been utterly inadequate to qualify her for work which was almost entirely social in character. Without additional preparation she is obviously handicapped and unable to enter her rightful place of expert adviser in the nursing aspects of this great work; she could not assume her rôle of authorized servant to the people. She is still only the handmaiden of the doctor rather than a coöperator and counsellor with the practitioner of preventive medicine. On the other hand, the lay social worker, perhaps equipped with a college education or a school of philanthropy course, but unprepared to deal with problems which have their origin in illness has been freely accorded the distinction of "peer" to the physician. When, in this connection, consideration is given to Edward T. Devine's statement that in 75 per cent. of the cases that register with the Charity Organization Society of New York City the primary cause of poverty is illness, the claim is not unwarrantable that a nurse's knowledge, if not her experience, is an indispensable factor in the education of the medical social worker. Granting, however, that only nurses with social vision and social instinct and special preparation for social work are rightly eligible to this big new field, what constitutes that special preparation?

In answer to this question, it is not too much to say that to be the versatile woman which the demands of this office bespeak, the nurse should have at her command at least some of the knowledge required in all the other branches of public health nursing above described, for practically every day's program will bring under her care people of all ages and conditions.

This latter statement suggests the conclusion to which it is designed this paper shall lead. If, in direct response to the awakening social conscience, the public has called to its aid in quick succession and as several parts of one great cause, tuberculosis nurses, school nurses, infant welfare nurses, industrial nurses, and social service nurses, along with many other agents enlisted in the same enterprises, and if the public demand has grown faster than public funds to supply the demand, how can the present situation be met?

It is interesting to trace the growth of these several expansions and specializations of what was once generally known as visiting nursing. These divisions of labor occurred in the beginning because funds are appropriated for specific purposes and could not be diverted to others. Later their exponents came to believe (and a great many do still) that thorough and effective work could only be done by people exclusively devoted to one kind of work. But while separate staffs of nurses doing these various forms of work have been maintained in many of our greatest cities, the smaller cities, towns and rural districts have also been hearing the message of community health and have been searching for ways and means of establishing better standards of living in their midst. They could not, however, secure funds, either public or private, for many nurses, so they have been obliged to seek one or more who could and would serve the community in a general way; and with a surprising degree of success a great many women have fulfilled this mission.

At the same time a growing consciousness of overlapping, duplication and waste of effort and funds has become apparent in all places large or small where special workers have been employed. Moreover, the workers themselves and the public have realized ever more forcibly that each separate movement was but part of one big public health campaign and must constantly overreach its own specific bounds in order to do finished work within those bounds.

Hence, the following observations of approximately a decade's work will hardly be contradicted:

1. Overlapping of service with (a) confusion of workers and (b) unnecessary measure of dependence and even pauperization of beneficiaries.
2. Frequent failure to secure the desired, because of lack of entire harmony of plan and procedure among the workers.
3. Waste of funds due to extensive territory covered by specialized field workers and duplication of administrative machinery and attendant overhead charges.

Therefore, *one* means of overcoming these defects is to reduce the variety of workers by demanding for the larger communities, as well as the smaller, women adequately prepared to be general public health nurses. Instantly the question is heard, is this practically possible, either in point of numbers or of education?

In reply let it be said it is increasingly so:

1. Because this field of nursing is attracting a large number of educated women into the profession who formerly found no interest in it.

2. Because, presumptuous though it sounds, it has been found possible to crowd into one academic year of eight months a reasonably satisfactory theoretical foundation for this work and a thorough preparation in one and a half to two academic years, the content of which provides the subject for another paper.

3. Because it is altogether probable that the experiment now being worked out in Bellevue Training School and the School of Philanthropy in New York City (which offers a course of two years in the Training School and one year in the School of Philanthropy, leading to the diplomas of both) will eventually be so modified in some other carefully selected schools as to furnish just the courses needed to meet the particular requirements of general public health nurses. (Let it be distinctly understood in this connection, however, that this most recent departure from the established traditions of nursing education is attended with very *real* dangers, which it is not within the province of this paper to discuss.) It may thereby be made possible to prepare women for this work in the same length of time that is now spent by nurse students in all first class schools of nursing where three calendar years are now given to technical training.

4. Several universities, colleges and technical schools are already offering courses especially designed for nurses and will assuredly give more when the demand warrants.

Therefore, it seems safe to say that when the public demands the general public health nurse, the schools and colleges will furnish the requisite education; and the combined incentives of opportunity for public health service and available academic studies will attract a sufficient number of intelligent, high-minded women to meet that demand.

Moreover, granting that this splendid new work of health protection and education, great with possibilities for the nation at large, can never be extended to all the people including our vast rural population until the worker is made financially possible, how can her services be most speedily and extensively secured?

Experiments and demonstrations in all of the specializations have been and are still being made by private philanthropies; but, when proven to be a community obligation, they should be—and more and more generally are being—squarely placed on the shoulders of the community, to be borne at public expense, as has been so clearly set forth by Sidney Webb in his article called "The Extension Ladder." Better still will this great cause be served when the States write into their health codes clauses providing for public health nursing service, as New York State has recently done, thereby insuring uniform standards of control. Then will be possible the lowest terms of cost consistent with high standards of work—and this combined standard of efficiency and economy will be best served through the services of a general public health nurse, who is conscious of being only a part, although an indispensable part, of the health program of her community.

Quoting from an article by Dr. J. N. Force, entitled "A Health Town"—

"In these days the voice of the people is growing louder, and with ever increasing education, the voice speaks in a more positive tone. Once the voice was hushed before the manifestation of great plagues; now the voice asks reasons. The social conscience of the people will speak to the individual who is loudly demanding freedom and say, 'You are free only as long as you do not interfere with all of us; if you live in the pack, you must abide by the pack-made laws, which are made by all of us.' The social conscience whispers to the person who is opposed to medical inspection of schools: 'You are stealing the time of all of us, if your near-sighted child has to repeat a grade. Your child is our child in our schools. You have no right to hold it back at our expense, because you do not believe in glasses.'

"The social conscience speaks to the school teacher: 'We are going to demand that you teachers learn the early signs of measles. Your ignorance plus the ignorance or disbelief of parents regarding disease, is too expensive for all of us to bear. You are one of the favored class. From those to whom much is given much is expected.'

"The social conscience says to the mother: 'Yes I know that it is your child, but after a while, your child will be our citizen, and we want him to take his proper place and bear his share of the load. There is load enough for strong men, and we need no more weak ones. Therefore, we are going to send a wise woman to talk to you. We call her a health visitor. She is our representative. Listen to her.'

"The social conscience speaks gently to the busy family physician: 'Don't you think if you saw fewer patients and made more careful diagnoses in the cases you do see, and read up modern treatment and took a postgraduate course once in a while, that you would do more good in the world?' And the honest physician answers and says: 'Oh, voice of the people! I know, I know, but good diagnosis costs, and proper hospital treatment costs, and expert consultations cost. All of these things are for the rich, for they have money, and for the poor, for they receive charity; but how can the wage earner afford these things?'

"And the social conscience will speak again to the physician and say: 'As you labor for all of us, so will we care for you. But the life of the citizen does not stand in danger in our court of law because of lack of counsel; should it stand in danger in the sick room because of lack of consultation?' If a citizen is entitled to schooling at the expense of the state, in order that he may bear his share of the common load, is he not entitled to an equal measure of health protection?

"There is no more heartbreaking thing in preventive medicine than the problem of the tuberculous family, and it will never be solved without the help of the social conscience. Here is a man clinging to his work to provide the means of life for his young children, while at the same time he is sowing in them the seeds of death. Some day the social conscience will say to that man: 'You and your family must go to a camp colony. We can guard your children better there. We have provided an out-of-door school, and after you have rested a year you can work a little for all of us.'

"The social conscience has spoken in Austria, Germany and England, and in those countries you can buy insurance against sickness, old age, accident or loss of employment. . . . The voice of the people one day will demand the absolute socialization of medicine."

In closing, may it be permissible to add that not only will the voice of the people one day demand the absolute socialization of medicine, but of nursing as well. No inconsiderable amount of thought is being directed toward the possibility of some form of sickness insurance with nursing care, which may be acceptable and available to all people, as the first decisive step toward the final goal of free public health.

THE FEDERAL MEAT INSPECTION SERVICE AND SANITATION OF PACKING HOUSES UNDER ITS SUPERVISION.

George H. Shaw,
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Read before the General Sessions, American Public Health Association, Jacksonville, Fla., December 1, 1914.

With the increase in urban population and the growth of specialization in the various industries, have come new problems. Not the least important of these is the problem of properly protecting and safeguarding the meat supply of the country. In the early days before the present concentration of the packing house industry in a few large centers, the individual usually raised and slaughtered the meat for his family and was thus independent of outside sources, but with modern business methods he has become dependent for his supply on the large packing house centers, and must, therefore, rely upon Government, State or Municipal inspection to determine whether the meats prepared at these centers are wholesome and fit for human food. It is the purpose of this paper to describe briefly that part of the work of inspection performed by the Federal Government, as well as the sanitary conditions in the packing houses which prepare meat food products under Government supervision.

The first meat-inspection laws passed by Congress were not sufficiently broad to give the Department of Agriculture adequate control over the interstate meat industry. The original law, that of August, 1890, provided only for the inspection of meats for export. This was followed by the law of March, 1891, which provided for the inspection of live cattle, hogs, and the carcasses and products thereof, but gave no control over the sanitary conditions in packing houses or authority to prevent the transportation from one State or Territory to another or to any foreign countries of condemned carcasses or parts of carcasses. The amendment of 1895, although it corrected this latter deficiency, failed to provide other needed legislation. It will be seen, therefore, that the Department of Agriculture had but limited supervision over the meat industry during the period previous to the passage of the law of 1906, and was without authority to make regulations that were considered necessary.

The Meat Inspection Law of June 30, 1906, now in force, corrected many of the deficiencies of previous laws. This enactment was largely brought about by the agitation of 1906, which directed public attention to the inadequacy of existing meat inspection legislation. The criticisms, given considerable publicity at that time, related almost wholly to canned and prepared meats, the use of preservatives and the insanitary conditions in packing houses. Previous to this agitation several unsuccessful efforts had been made by the Secretary of Agriculture and the Chief of the Bureau of Animal Industry to procure the enactment of new legislation and an increased appropriation to extend the inspection work and improve its efficiency, but at the time of these disclosures the Department did not have control over the matters under criticism.

The present law, passed June 30, 1906, provides a permanent annual appropriation of $3,000,000 and gives the Secretary authority to make the necessary regulations to govern the various packing house operations and to prescribe the necessary sanitary regulations. In addition to the inspection of live and slaughtered animals provided for by the former law, it provides that meats and meat food products in all stages and processes of preparation, curing, canning, etc., shall be inspected, and prohibits the use of harmful chemicals and preservatives and misleading labels. This law, therefore, gave the Department the power to regulate the interstate meat industry and during the eight years since its passage it has been found to meet conditions much more satisfactorily than did previous laws.

The enforcement of this law is one of the functions of the Bureau of Animal Industry of the Department of Agriculture. At the present time meat inspection is conducted in over 800 establishments in 232 cities and towns, and a small army of veterinary inspectors and lay inspectors, numbering about 2,400, is required to carry on the work. At many of the local subdivisions or stations but few men are required, but at the largest station the meat inspection force under the supervision of the local inspector in charge includes over 400 men.

It is evident that some form of traveling supervision is necessary to maintain uniformity and efficiency at the numerous widely separated stations. This important service is performed by traveling veterinary inspectors who make unannounced periodic visits and thoroughly review the work at the station. An architect and a sanitary engineer are also attached to the inspection staff. Their duties are to make investigations and submit reports when conditions arise that require special knowledge along architectural and sanitary engineering lines.

The inspection of food animals, as conducted by the force of Government inspectors just described, may be divided into three parts: *First*, a careful antemortem examination in the stock yards or at the establishment; *Second*, a thorough postmortem examination while the carcass is being dressed; and, *Third*, a reinspection and supervision of cured and canned meats.

The antemortem inspector examines the animals offered for slaughter to detect certain diseases and conditions, such as acute hog cholera, immaturity and acute febrile diseases, in which symptoms are pronounced on antemortem examination but often slight or not present on postmortem examination. When he observes an animal showing symptoms or suspected of being affected with any disease or condition which would probably cause its condemnation in whole or in part when slaughtered, he affixes a numbered metal tag to its ear bearing the words, "U. S. Suspect." Such animals are slaughtered separately.

The postmortem inspection is performed by graduate veterinarians who become very skilful in rapidly detecting diseased and abnormal conditions. Upon this inspection is placed the main reliance for determining whether the meat is fit for human food, for animals are frequently found that appear to be perfectly healthy and in good condition on antemortem inspection, but upon slaughtering the postmortem inspection may reveal generalized tuberculosis and other diseased conditions. To detect any obscure signs of disease, the inspector palpitates and lays open with a knife the various parts and upon finding any such condition he affixes an official numbered tag and retains the carcass for final examination. The final examination of a carcass to determine whether it shall be condemned or otherwise disposed of is made by the veterinary inspector in the "Final" room, where there is ample time for a thorough examination.

No. 1. Antemortem Inspection of Cattle.

The supervision of the curing and canning, and the reinspection of meats is generally performed by "lay" inspectors. These men are specially trained in the preservation and processing of meat food products. Their duties are to see that the meats have not spoiled or become otherwise unwholesome since inspection at the time of slaughter, and to guard against adulteration, the use of harmful chemicals or preservatives, and dishonest labeling, as well as insanitary methods of canning and processing.

With this brief outline of the method of conducting inspection, it may be of interest to summarize its results and indicate the magnitude of the work performed by the Meat Inspection Service.

No. 2. Final Examination of Retained Carcasses.

Statistics covering the past eight years, during which meat inspection has been in effect, show that over 434 million animals have been slaughtered. Of these, over one and one third million whole carcasses and over five and one half million parts of carcasses have been condemned as unfit for food. Inspection or reinspection was made of over 40 billion pounds of meat and meat food products, of which over 179 million pounds were condemned.

The economist will doubtless deplore the loss for food purposes of such a large quantity of meat, while, on the other hand, the Department has been publicly criticized for not condemning all carcasses and parts of carcasses found even slightly diseased. To obtain the best scientific knowledge available as to the right point to draw the line, Secretary Wilson, in 1907 appointed a committee of the foremost pathologists and hygienists to study and report on the meat inspection regulations as drawn up by the Department. These eminent scientists endorsed many of the regulations without comment and outlined certain rules for the disposition of meats, which have since been adopted.

Until recently no provision was made for a second grade product from animals affected locally and only slightly diseased, as is common in Europe. The new regulations which went into effect in November, 1914, however, permit the use of the wholesome portions of such meat when thoroughly sterilized and properly labeled. This provision is expected to add considerably to the amount of meat available for food purposes.

The imperative need of meat inspection has been recognized by most foreign countries and is shown by experiments regarding the danger to man from the consumption of meat from tuberculous animals and by the poisoning resulting from eating meat that is diseased. An exhibit of specimens of diseased organs and parts of carcasses that are daily condemned by Government veterinary inspectors can not but interest the layman and impress him with the value of the work.

Government inspection of meat is then a public necessity and has three important functions.

First: To protect the consumer from tainted and diseased meats.

Second: To insure proper sanitary conditions and cleanly conduct of operations.

Third: To prevent adulteration and fraudulent labeling.

That the Service is performing these functions effectively and deserves the confidence of the public is evidenced by the report of Prof. Wm. T. Sedgwick, who was appointed by Secretary Houston in 1913 to investigate the Federal meat inspection service in the States of Massachusetts and Connecticut. The following quotation is taken from the final sentences of his report:

"In conclusion I may say that, cut short by illness as my investigation of the meat inspection service has been, I am, nevertheless, deeply impressed with its excellence, its usefulness and its efficiency. It is everywhere admitted, I think, that the United States meat inspection is far superior to any provided by the States and that these constantly look to it as a model toward which they are striving."

We may now pass from a consideration of the actual work of inspection and of the personnel of the force that conducts it, to a survey of the sanitary conditions under which meats are prepared in Government inspected packing houses.

Some of the conditions that obtained previous to the passage of the present law are described by Mr. Chas. P. Neill and Mr. James B. Reynolds, in their report to President Roosevelt in 1906. They found a general lack of cleanliness in the handling of meats and products, poor ventilation and lighting, inadequate toilet conveniences and other sanitary defects. This report was an important factor in bringing about legislation which has made it possible to correct these conditions.

Regulation No. 8 of Bureau of Animal Industry Order 211, entitled "Regulations Governing the Meat Inspection of the United States Department of Agriculture," contains the sanitary regulations which the law authorized the Secretary of Agriculture to prescribe. They are designed to be broad in their application and include, among other things, provisions for a pure water supply, abundant light and ventilation, efficient drainage, proper structural conditions, exclusion of odors from edible products departments, adequate sanitary conveniences, sanitary equipment and the cleanly conduct of operations. Any failure of the establishment to meet the regulations is reported upon weekly by the under inspectors to the inspector in charge, who transmits a monthly sanitary report to Washington.

No. 3. Canning of Corned Beef, Showing Sanitary Building Construction and Equipment.

Space permits only of consideration of the phases of packing house sanitation which are of special interest to the sanitary engineer, viz.; water supply, drainage equipment and disposal of wastes, control of odors and structural conditions.

The water supply of many packing houses is obtained from driven wells, while at others the public mains furnish the supply. Unfortunately, in some localities the only water supply available is not considered safe for use on edible products. This presents a serious difficulty, but it has usually been found possible to sterilize such water by heating with exhaust steam which is generally easily obtainable. The Bureau maintains a laboratory for water analysis at Washington, where samples from the various establishments are examined as the occasion demands. In suspicious cases these examinations are supplemented by investigations and reports by the Sanitary Engineer.

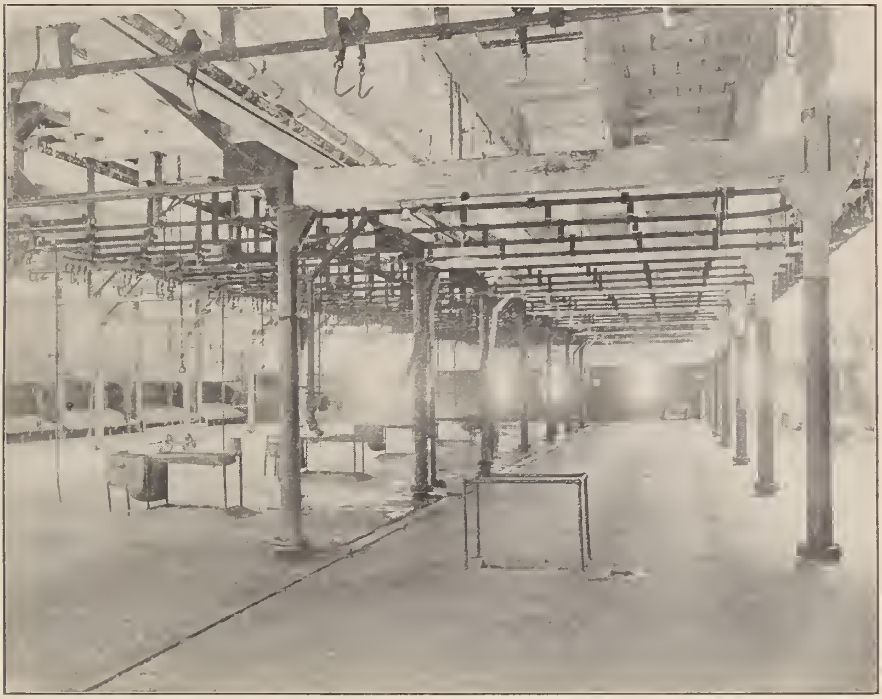
The regulations specify that the water supply shall be ample, clean and potable, with adequate facilities for its distribution through the plant, and that the establishment, whenever required, shall afford opportunity for the inspection of its water supply.

The drainage equipment of packing houses and the disposal of their wastes is a special application of the art of sewerage and sewage disposal. Large amounts of liquids, including blood, must be satisfactorily handled, and waste materials, such as paunch contents, manure from stock yards and fertilizer by-products, must be disposed of without undue nuisance.

Floor liquids are usually conducted to the main drainage pipe or "stack" by means of open floor gutters provided with removable cover boards. This method of drainage prevents clogging and is adapted to thorough cleansing. The gutters are connected to the "stacks" through suitable traps which exclude odors and steam from operating rooms. These vertical drainage pipes or "stacks" must be continuous from the top of the building to the basement, and not of the "interrupted" type, terminating at each floor, which was common in the old packing houses.

The usual methods of disposal of packing house drainage are by dilution, and by discharge into the city sewers, but some disposal works have been constructed. They have generally proven unsatisfactory, due to the very refractory material that must be dealt with and the lack of attention usually given them. The special investigations being made at Bubbly Creek by the Sanitary District of Chicago, will doubtless add greatly to our knowledge concerning the best methods of disposal of packing house sewage.

The control of objectionable odors from industrial plants is occupying more attention than formerly. In the past, rendering works and packing houses have been the chief offenders. Numerous suits have been entered against their owners and they have been forced to seek a remedy for the objectionable conditions. Within the past year plants have been completed which give promise of operating without becoming a nuisance to the community. Fertilizer driers are, perhaps, the chief source of bad odors and at the plants mentioned gases from these driers are disposed of by passing through water and by combustion under the boiler grate. A large central shaft is also provided so that air from the various floors may be drawn into it by powerful fans. This central shaft leads to a large condensing chamber on the roof, containing numerous jets of water where the foul air is purified and is then allowed to escape. In addition to this equipment, a flue is provided to conduct the non-condensible gases from the condensation chamber to the boiler grate in case passage through this chamber does not sufficiently destroy the objectionable odors.



No. 4. Beef Killing Department, Showing Lighting Conditions, Floor Drainage System and Equipment.

The Bureau regulations regarding odors relate only to conditions within the packing house. They require that rooms and compartments in which meat or products are prepared or handled shall be free from odors from dressing and toilet rooms, catch basins, hide cellars, casing rooms, inedible tank and fertilizer rooms and stables.

Many millions of dollars have been spent to improve structural conditions in Government-inspected packing houses in the eight years since the passage of the Meat Inspection Law. At the outset much reconstruction was necessary to meet government requirements and permit the inauguration of meat inspection. Many of the packing houses thus made temporarily acceptable have since been torn down and replaced with modern structures.

The packing house of ten years ago was generally constructed of wood and little attention was given to lighting, ventilation or sanitation in general. The life of such structures was very short, due largely to the great quantity of water used in the various departments and the heavy trucking over the floors.

The modern packing house is an evolution from this type of building. The wooden structure has been replaced by fireproof construction of reinforced concrete and every means is provided to make cleanliness easy rather than difficult. These include impervious floors sloping to gutters, permitting free drainage, and smooth walls of cement or white tile brick. Cleanliness of the workman is also well provided for by laundries for washing his clothing and by modern toilet and dressing rooms equipped with shower baths and hot and cold running water.

If the present rate of progress continues, this modern type of packing house will soon take the place of the comparatively few structures remaining in which sanitary conditions are maintained only at large expense to the owner and constant vigilance on the part of the government inspectors.

In conclusion, special attention is directed to the need of supplementing Federal meat inspection with efficient State and Municipal inspection, for this is a matter that merits immediate and concerted action by health officers and all concerned in promoting conditions that make for the public health.

The insanitary, uninspected slaughter house exists today, in spite of the efforts of the Department and public-spirited persons, to bring about reform. Many have doubtless sought the reason for the anomaly of an uninspected, insanitary slaughter house in close proximity to one where government inspection and sanitary conditions are maintained. It is to be found in the interstate and foreign clause of the Constitution, which limits Federal regulation to establishments engaged in interstate and foreign commerce. Establishments, therefore, the meats from which are slaughtered, prepared and consumed entirely within a single State, are beyond the jurisdiction of the Federal Government.

It is estimated that 60 per cent. of the meat supply of the country is Federally inspected. Of the remaining 40 per cent., a portion receives more or less efficient local inspection, while the rest is without any form of inspection. This uninspected portion is often prepared under most unsavory conditions, and, furthermore, an abnormally high percentage of diseased animals may be expected, since tuberculous dairy cows and suspicious looking animals are often sent to such establishments to avoid condemnation by Federal inspectors.

The remedy is to be found in efficient State and Municipal inspection and the development of the Municipal Abattoir system common in Europe. An abattoir of this kind will eliminate the nuisance caused by several scattered, ill-smelling and insanitary slaughter houses, will enable inspection to be conducted at a minimum of cost and will make possible the utilization of by-products now usually wasted. The Bureau of Animal Industry is prepared to furnish plans and specifications for such central abattoirs and will gladly coöperate and give any possible information or advice with regard to establishing local inspection.

Already efficient meat inspection systems have been established in various parts of the country and there is promise that soon the States and Municipalities without adequate local inspection will take the necessary steps to effectively supplement the work of the Federal Meat Inspection Service.

List of Publications of the Department of Agriculture Relating to the Subject Matter of this Paper.

(Those indicated by an asterisk can be obtained by applying to the Bureau of Animal Industry, U. S. Department of Agriculture, Washington, D. C.)

*The Federal Meat Inspection Service, by Dr. A. D. Melvin, Chief, Bureau of Animal Industry.

*State and Municipal Meat Inspection and Municipal Slaughter-Houses, by Dr. A. D. Melvin, Chief, Bureau of Animal Industry.

Report of a Commission on Certain Features of the Federal Meat Inspection Regulations.

*Regulations Governing the Meat Inspection of the United States Department of Agriculture, Bureau of Animal Industry Order 211.

*The Sanitary Construction and Equipment of Abattoirs and Packing Houses, by G. H. Parks, Architect, Bureau of Animal Industry.

A MODIFICATION OF PONDER'S STAIN FOR DIPHTHERIA.

J. J. Kinyoun, M. D., Ph. D.,

Bacteriologist, Health Department, Washington, D. C.

Read before the Laboratory Section, American Public Health Association, Jacksonville, Fla., November 30–December 4, 1914.

Ponder* has described a stain for the diphtheria bacilli which consists of a weak solution of Toluidin Blue.

His method is to examine a smear or culture, from a suspected case of diphtheria in the form of a hanging drop. A smear is made on a coverglass, then a loop of the stain applied and then inverting the specimen over a cell slide, and examined as a hanging drop. The granules of the diphtheria rod stand out sharply, the limiting membrane is unstained while other bacilli are stained faintly if at all. Cultures of diphtheria give a striking picture and particularly is this so when artificial light is employed. When viewed by artificial light the granules are of a dark ruby red, and there is a faint suggestion of the outlines of a rod—just a shadow—sometimes the granules only.

Ponder seems to think that this stain employed in this manner, brings out the characteristics of the diphtheria bacillus quite as good if not better than the Neisser stain.

Neisser stain when it is standardized for a given culture gives most beautiful and perfect pictures of the granules and rod. Oftentimes, however, the stock solution does not act in this manner, and we have to modify it to suit the particular culture.

The chief objection which I have found to Ponder's stain is that staphylococci, diplococci, and streptococci are sometimes stained, in a manner as to resemble the granules in the diphtheria rod, and may be difficult to determine in some instances whether they are one thing or another. Now if the rod was defined no such condition could arise.

Another drawback to the application of this stain is the element of time required to prepare and examine each hanging drop preparation. When only a few are to be examined this will not matter so much but where a large number are to be examined it is a great consumer of time.

I have modified the stain in a few particulars so that it will stain the rods and at the same time not interfere with the granules. Further, this stain can be employed just in the same way as Loeffler's or other laboratory stains.

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* Lancet, July 6, 1912.

The formula proposed is:

Toluidin Blue	0.1 gram
Azue 1	.01 gram
Methylene Blue	.01 gram
Acetic acid (glac)	1 cc.
Alcohol, 95 per cent	.5 cc.
Water	120 cc.

Preparations (smears or cultures) are made in the usual manner, fixed with heat, allowed to cool, and stained 2 minutes or more—it does not overstain even to 7 minutes.

The diphtheria bacilli stand out prominently from all others, the granules are clear, sharp and of a dark red, while the rod is stained a pale blue. Other bacilli are stained pale, and evenly throughout staphylococci, and diplococci sometimes resemble the granules, but have nothing stained between them.

It is of great value in the release cultures, where the bacilli are few. Little or no difficulty is had in identifying these, quite a contrast, to those stained with Loeffler's Blue.

It is of great value in excluding Hoffman's bacillus. This bacillus, so far as my observation goes, does not show any granules, whereas in diphtheria cultures we have found the granules even in the barred type.

I have now been using this modification of Ponder's stain for the routine examinations and find it superior by far to any stain that has been proposed.

REPORT ON THE HEALTH OF YORK, MAINE.

A brief review of the situation at York in regard to public health is not amiss at the opening of the new year. In the late summer and early autumn of the past year there were a number of cases of typhoid fever in York Harbor and the vicinity. While these cases were not enough in number and severity to constitute a serious epidemic, the mere presence of the disease in such a popular seaside resort naturally gives rise to considerable alarm. York met the situation in the following way, which should serve as a model to any other town in similar circumstances. There was no attempt to conceal the fact of the existence of the disease and its extent, the authorities very properly feeling that the way to meet any danger was to face it in the open.

At a meeting of the Village Improvement Society, a committee was appointed to confer with the Selectmen and the Board of Health. As the result of this conference, a town meeting was held late in September and money was voted to meet the cost of a sanitary survey of the town which was made by Professor Milton J. Rosenau of Harvard University. While nothing very startling was discovered, a situation was found which showed that there were conditions which might and probably did affect the public health. As a result of the report of Professor Rosenau, a town meeting was held at which it was voted to employ a health officer, and $2500 was voted for his salary and the expense incidental to the work.

The town is to be congratulated upon the selection of Mr. William Eustis Brown as its health officer. Mr. Brown has had a thorough training in sanitation and preventive medicine both at the Massachusetts Institute of Technology and at Harvard University. He is a graduate of the School for Health Officers and has had varied and wide experience in sanitary work of all kinds, and is well qualified to carry on the work.

This step which York has taken at once places it in the fore-front of progress as far as health is concerned. York has determined to safeguard its citizens and all strangers within its gates and give them the security of health that a well-ordered sanitary department can furnish. Although blest with natural advantages of an unusual order, an admirable location, a charming scenery both of sea and country, and a delightful climate, York is not going to depend upon nature and luck for a clean bill of health. It has been said that "public health is purchasable," the price is moderate and the action of York shows that she intends to enjoy the best attainable protection from disease. Such protection ranks far above any other advantages which a summer resort can enjoy. Many resorts have acted on the policy that a good climate, charm of location and beauty of scenery are sufficient inducements to attract the summer visitor; but nowadays people are more wary and wisely look for more than this before selecting a vacation playground. The visitor wants a clean bill of health for the resort he has chosen and is entitled to have one. York will now be able to furnish this assurance.

There may be some obscurity as to the duties of a health officer in a small town such as York. Cases of communicable disease may arise in any community. Typhoid fever lurks in almost every country district in the land, always ready to strike if the opportunity offers. Some of the 8,000 people from various parts of our broad land who visit York annually may introduce infection. It will be one of the duties of the new health officer to ascertain the existence of infectious diseases and take immediate measures to prevent their spread. Cases of such diseases will be traced to their source and practical preventive measures will be applied without delay.

Furthermore, the health officer will examine the sources of water supplies and analyze them. He will inspect the milk supply, visit and examine dairies, see that cows are healthy, that the milk is gathered in a cleanly and safe manner. This is of great importance as disease is often spread through contaminated milk. A little advice as to dairy management is often of great advantage to the milk producer.

Other foods, such as oysters, clams, meat, lettuce, etc., will be inspected by the health officer in order to be sure that the dealers comply with the pure food laws. The health officer will also inspect markets, kitchens, provision shops and storerooms where food is handled and kept. He looks after nuisances, prevents pollution of the beaches, conducts a campaign against flies and mosquitoes, supervises the harvesting of ice and performs many other duties which are included in the art of hygienic living. He keeps the vital statistics in accordance with modern methods. With careful records he is able to compare the health of York with other communities and to determine whether the measures he is taking are effective; and to trace the progress of health and disease, of births and marriages, and other vital factors affecting every member of the community.

York must some time in the not distant future look forward to the installation of a sewage system. This work must not be undertaken hastily, and information must be collected which will be of service in providing a proper system. To collect such information and to study the local conditions will be a part of the duties of the health officer.

In connection with the position, a chemical and bacteriological laboratory will be equipped where analyses may be made. This laboratory also will be prepared to make blood tests in order to early recognize cases of typhoid fever, to examine throat cultures in order to diagnose diphtheria, and to generally assist the physicians in the early recognition of other infections and to ascertain the time when such cases may be released from quarantine so that they will not menace the community as bacillus carriers.

We may all feel more secure in the health of our families and particularly of our children now that such a work has been undertaken.

Joseph P. Bragdon,
Chairman of Board of Selectmen.
Willie W. Cuzner,
Secretary of Board of Health.
W. T. Councilman,
Chairman of Committee of Village Improvement Society.

THIRD PROGRESS REPORT OF THE COMMITTEE ON STANDARD METHODS FOR THE EXAMINATION OF AIR.

Read before the Joint Session of Laboratory and Sanitary Engineering Sections, American Public Health Association, Jacksonville, Fla., November 30–December 4, 1914.

The Committee on Standard Methods for the Examination of Air made its first report in 1909 (published in the *American Journal of Public Hygiene*, XX, 346) and presented a second Progress Report at the Washington meeting in 1912 (published in the AMERICAN JOURNAL OF PUBLIC HEALTH, III, 78). The field of work which falls to the Committee is a large one and it has not yet been possible to arrive at definite conclusions in regard to the best procedures for certain specific purposes. By 1916 it is hoped that a fairly complete report can be rendered and the Committee discharged. At the present time the Committee deems it best, in accordance with its previous policy, to present a report of progress setting forth the advances made during the past two years and the present status of the various subjects under consideration.

The principal determinations which have occupied the attention of the Committee are five in number.

(1) Temperature and Humidity,
(2) Dust,
(3) Carbon Dioxide,
(4) Bacteria,
(5) Poisonous Gases and Metals.

The methods for the first, third and fourth of these determinations are now well standardized and reasonably satisfactory. The second and fifth require further study.

(1) *Temperature and Humidity.*—The standard methods recommended in 1909 for the measurement of temperature and humidity—the recording thermometer and the United States Weather Bureau Sling Psychrometer—continue to prove entirely satisfactory for practical purposes.

Two new types of psychrometer have recently been suggested, both of which seem of value for special purposes.

The first is a small portable psychrometer suggested by Howe (AMERICAN JOURNAL OF PUBLIC HEALTH, III, 784) for use in street cars and other confined spaces. In this device the wet bulb is dipped in Japan Gold Size covered with leaf gold or copper foil and then coated with platinum black. A current of air is produced by means either of a small electric fan or of a cautery bulb and the coated wet bulb is said to respond with great rapidity and accuracy.

Another important advance in psychrometry is the Recording Psychrometer made by the Bristol Company, in which the expansion of an inert gas in wet and dry bulbs is transmitted through tubes to a recording clock dial of the usual type. This apparatus has been used for nearly a year in experiments carried out under the observation of Professors Phelps and Winslow of your Committee by the New York State Commission on Ventilation and has proved itself entirely satisfactory.

(2) *Dust.*—In its 1912 report, the Committee particularly mentioned two procedures for dust determination, the ordinary sugar filtration method, and a method in which the dust particles are collected by directing a current of air against a glycerinated plate.

Two objections have developed to the sugar filtration method, the inaccuracies due to dust present in the sugar and the small and therefore somewhat unrepresentative samples which can be dealt with. In order to avoid the errors due to dust in the filtering medium the use of resorcinol instead of sugar has been suggested. This medium has been tested out by several members of the Committee and proved superior to ordinary brands of sugar. A particular brand of sugar sold under the name of Crystal Domino Granulated was finally found which is practically free from dust, being superior even to resorcinol.

The sugar filtration method as described in the previous reports of the Committee, and with the specification of clean sugar as a filtering medium, seems on the whole satisfactory for the study of the rather minute but not sub-microscopic particles which occur to the number of some 100,000 to 500,000 particles per cubic foot in ordinary indoor and outdoor city air. These particles Professor Whipple and Mr. M. C. Whipple (AMERICAN JOURNAL OF PUBLIC HEALTH, III, 1138) find to average about 3 microns in diameter and to range from .5 to 15 microns. Professor Whipple has used this method extensively and has brought out some very interesting local differences in dust content by its use. Thus samples taken at the various stories of the Woolworth Building in New York showed a progressive decrease in dust count from 221,000 dust particles per cubic foot at the street level to 27,300 particles at the fifty-seventh story. The numbers found in indoor air are higher. Professor Whipple found that the air of the Y. M. C. A. College Gymnasium at Springfield, Mass., contained usually more than 100,000 particles per cubic foot and sometimes 400,000. Professors Baskerville and Winslow in the study of 658 samples of New York City schoolroom air found numbers ranging as a rule between 200,000 and 400,000 particles per cubic foot, a few high samples raising the average to 600,000 (AMERICAN JOURNAL OF PUBLIC HEALTH, III, 1158).

In the study of the air of a dusty office building in New York City, Professor Winslow found an average of 485,000 particles per cubic foot in fifteen samples collected while dry dusting was not going on, while nineteen samples collected during the process of dusting gave an average of 694,000 particles.

Professor Whipple (*l. c.*) has applied this method of dust counting to the study of the efficiency of commercial air washers with the result that a number of types tested removed an average of only 54 per cent. of the dust particles in the incoming air.

Altogether it may be concluded that the sugar filtration method is a very satisfactory procedure for the study of the small dust particles (3 microns and thereabouts) which are present in almost all air to the number of 10,000 and more per cubic foot. In the study of industrial dusts which are the dusts of vital importance from a sanitary standpoint, we are concerned with larger but less numerous particles. When two or three cubic feet of air only are filtered and the dust filtered out is suspended in a Sedgwick-Rafter cell and counted, these less numerous but large and dangerous particles are apt to be lost. Thus studies made for the New York State Commission on Ventilation by the sugar filtration method failed to show any material difference between the air of a hat factory and that of the city street.

What is needed for the industrial dusts is some method by which a larger volume of air may be examined. This end is accomplished by the method in which a current of air impinges on a glycerinated plate discussed in the 1912 Report of the Committee. Studies made during the past year for the New York State Commission on Ventilation have, however, shown considerable errors in this procedure, a material proportion of the dust being carried over and past the glycerinated plate without adhering to it. The Chicago Association of Commerce Committee on Smoke Abatement has obtained interesting results by filtering large volumes of air through a soxlet paper thimble filled with cotton and subsequently weighing the dust and examining it under the microscope, but the collection of a sample by this procedure occupies six hours.

An ingenious device for throwing dust particles out by centrifugal force in a rapidly revolving tube has been suggested by Mr. W. F. Wells of the United States Hygienic Laboratory and is now being tested out by members of the Committee.

It is the feeling of your Committee that the sugar filtration method is reasonably satisfactory for the study of the smaller and more numerous particles in air but that the question of the best procedure for enumerating the larger and less numerous particles produced by industrial processes requires further study.

(3) *Carbon Dioxide.*—The experience of the last two years tends to show that the modified Petterson-Palmquist apparatus recommended in the 1912 Report of the Committee is entirely satisfactory for all practical purposes. Under most conditions samples of air may most satisfactorily

be analyzed directly in the field by the use of this apparatus. Where this cannot be done, as in railway cars for example, the samples must be taken to the laboratory for analysis and under such circumstances the sampling methods recommended in the 1912 Report of the Committee have proved successful. The carbon dioxide question seems therefore to have been satisfactorily solved.

(4) *Bacteria.*—The method recommended by the Committee in 1909 with certain minor modifications suggested in 1912 has been extensively used during the last two years and has given excellent results.

Professors Baskerville and Winslow examined 684 samples of New York City schoolroom air by this procedure and the New York State Commission on Ventilation has examined 353 samples of air from both indoor and outdoor sources. The general results (from a paper by C.-E. A. Winslow and W. W. Browne published in the *Monthly Weather Review*, XLII, 452) are cited below:

AVERAGE MICROBIC CONTENT OF AIR FROM VARIOUS SOURCES.

Samples.		Microbes per cubic foot.		Streptococci per 100 cu. ft.
Source.	Number.	20° C.	37° C.	
Country	85	56	30	12
City	134	72	32	11
Offices	87	94	80	22
Factories	47	113	63	43
Schools	684	96	.....	30

It will be noted that a determination of mouth streptococci is included in this table. The estimation of these organisms as indices of buccal pollution was discussed in the 1909 Report of your Committee and dismissed as unnecessary. Recent studies have suggested that under special conditions it may be worth while to take them into consideration. Nolte (*Annals Missouri Botanical Garden*, I, 47) reports very high results (one salivary coccus in 10 cc., in 1,800 cc., in 1,950 cc., and in 3,600 cc. of air respectively) in crowded street cars where pollution from mouth spray is gross and immediate. When streptococci are to be isolated the simplest method would seem to be to pick characteristic colonies from litmus lactose agar plates made in the usual manner. The production of acid in lactose broth and the presence of spherical cells (not usually in long chains) are the only tests necessary for the identification of the common type of salivary streptococcus.

(5) *Poisonous Gases and Metals.*—In the 1912 report of your Committee

it was pointed out that the formulation of methods for estimating the poisonous substances found in the air of certain industrial establishments was an important task which fell properly within the scope of the committee work. Methods for determining carbon monoxide and wood alcohol suggested by Doctor Graham-Rogers were outlined in this report.

In addition to carbon monoxide and wood alcohol, your Committee believes that tests for sulphur dioxide, amyl alcohol, amyl acetate and perhaps other poisonous fumes should be standardized. For lead and zinc satisfactory methods are already available.

Your Committee plans to devote its attention to the problems of dust and of poisonous fumes during the next two years and hopes to make a final report on these and all other phases of the subject in 1916.

T. R. Crowder,
C. T. Graham-Rogers,
E. B. Phelps,
G. C. Whipple,
C.-E. A. Winslow,
Committee.

REPORT OF THE COMMITTEE ON STREET CLEANING, SANITARY ENGINEERING SECTION, AMERICAN PUBLIC HEALTH ASSOCIATION.

Read before the Section on Sanitary Engineering, American Public Health Association, Jacksonville, Fla., November 30–December 4, 1914.

Data relating to methods and costs of street cleaning, while not as complete and reliable as they should be, are available in considerable quantities, and are rapidly accumulating since more careful and systematic observation and account keeping are being introduced into our street-cleaning departments. We are, however, still much in the dark as to the actual effect of street refuse and dust upon the public health. This applies not only to such refuse while it lays on the streets, but to the sanitary effects of its collection, removal, handling, and final disposal. To those who are chiefly interested in matters relating to the public health, these aspects of the subject are obviously of primary importance, and they are, therefore, most appropriate for consideration by the American Public Health Association. While your Committee has not overlooked this fact, it has not been able satisfactorily to deal with this phase of the subject because of the meagerness of exact and reliable information relating thereto. Some scattered observations and facts are available but no systematic study of the subject has been made. Many opinions have been expressed and printed by physicians and sanitary authorities upon the deleterious effects of unclean streets, and upon the dangers that lurk in unsanitary handling and disposal of street dirt, but, as a rule, these opinions have not been based upon actual scientific investigation and observation, and while entitled to respect, they cannot be regarded as conclusive. They seem to be based largely upon the general theory that all dirt and waste is necessarily unsanitary, and that, therefore, street sweepings must be deleterious to the public health in whatever way it may exist or be present. Such inferences are warrantable upon general principles in the absence of definite evidence for or against them, but, at a time when hypotheses are little more than interesting until they are established by scientific investigation and observation, these conclusions cannot be accepted without challenge.

It would seem that we have reached a stage in this situation when such scientific investigation and observation are necessary in order to make further progress in this field of municipal sanitation, and your Committee feels that it probably can render no greater service at this time than to call attention to the conditions that exist, and to urge that those who are in positions to do so should direct their efforts to a solution of the questions involved, and we, therefore, wish to outline briefly the work that seems necessary to be done. It is a field in which the coöperation of the physician, the sanitary engineer and the municipal government is necessary.

It has been generally held, and probably with sound reason, that street dirt as it exists on the streets, even temporarily, may be a source of zymotic disease. There can be no doubt that the germs of many contagious and infectious diseases reach our street surfaces and preserve their vitality for considerable periods; and that if introduced into the human system they may propagate themselves therein. We have no means of determining the quantities of such disease germs that thus reach the street surfaces and are intermingled with the street dirt, but a careful and systematic investigation might throw much light upon the subject, and might enable us to discuss intelligently the question whether the quantities thus found are sufficient to be a serious menace to the public health. It seems to be recognized that every human being takes into his system, from varying sources, disease-producing germs in greater or less numbers, but that, because of their minute quantities and the power of the human system to throw them off, the specific disease incident thereto may not result, except in cases of extreme debility or other predisposing conditions that furnish a fertile soil for their propagation and extensive growth. It is probable, for instance, that many municipal water supplies are not entirely free at all times from *B. typhosis*, but owing to the minuteness of the number present and their consequent great dilution in the water, typhoid fever may not result. If this be so, it may be possible that the quantity of disease germs in street sweepings is so small compared with the volume of sweepings and, therefore, so diluted, as to be practically negligible from a sanitary point of view. If this view is entertainable it becomes a very important question to determine the extent to which such disease germs exist in street dirt, both in normal and special conditions.

It is recognized that this may be a very difficult problem to solve. It would probably be next to impossible, in any case of disease, conclusively to establish the fact that the infection came from street dirt, but dependable evidence for or against the hypothesis might confidently be looked for in the relative prevalence of infectious diseases in classes of people especially exposed to opportunities for such infection. Thus, there are large numbers of men in all our cities engaged in patrol or hand street cleaning. They spend all their working hours on the streets, collecting and handling street dirt under conditions that peculiarly expose them to possible infection. Careful health records of these men as a class, continued over a sufficient period of time, should disclose with reasonable certainty whether they are more subject to the infectious diseases that might be expected to lurk in street dirt than laborers not thus directly exposed.

Again, if disease germs exist in street dirt, a careful bacteriological study of it on a sufficiently large scale and continued for a sufficient time should disclose to what extent the more easily recognizable, at least, of these germs are to be expected under normal or special conditions. Such an investigation to be of value would require a large amount of work and time, and would be attended with difficulties. The proverbial search for a needle in a haystack would doubtless be a comparatively easy task, but if we are to arrive at definite conclusions in this matter the work would seem to be of sufficient importance to warrant the labor and time required.

Since it is at least probable that these disease germs find their principal lodging place in the street dust, and that this dust is the principal vehicle of their dissemination, such bacteriological investigation might be confined to this material, which would make the work more simple and less laborious. Special care and thoroughness might be devoted to streets or sections of the city where any specific disease prevailed or was epidemic at the time.

What is said above applies quite as well to the sanitary dangers involved in collecting and transporting the street dirt from the street to the place of final disposal, though if it were found that the dirt on the street was not dangerous it might safely be inferred that no changes would take place in the short time occupied by these operations to make any infecting element more virile or dangerous. But here again careful health records of the men engaged in these operations would throw important light on the subject. In many cities a considerable number of men are constantly employed in the various operations of transferring street dirt from the collecting carts to barges, and in trimming the loads on the barges. Here they are dealing with the street dirt in large masses, collected from various sections of the city, the handling of which would seem to afford special facilities for the transfer of any disease germs to the bodies and lungs of the workmen, and we might expect that deleterious results would be more evident.

We have, so far, referred to zymotic diseases only; but danger is not confined wholly to these. During dry weather volumes of dust, raised by travel or by the wind, or both combined, float in the air from imperfectly cleaned streets. More or less of this dust is breathed into the lungs of those exposed to it, and even if it contains no disease germs, its presence in the lungs must be deleterious, as we know from investigations made in the case of dust in coal mines and other industrial operations. Even if it is not the immediate cause of sickness, it must tend to debilitate and make the human system more susceptible to the attacks of disease. This is probably also true of the exhalations arising from offensive matter, whether in a fresh or decaying condition.

In those cities where street sweepings are finally disposed of in large masses, in dumps, or for filling up low lands, the question whether such masses, especially in the process of decomposition, are or are not deleterious to the health of those living near them, has been discussed pro and con very frequently. But here again opinions seem to be based almost entirely upon loosely formed conceptions or *a priori* reasoning, rather than upon actual evidence. The idea that zymotic diseases may be transmitted by the effluvia arising from these decaying masses is now largely discredited, but it seems not unreasonable to infer that the process of decay of large quantities of organic matter must make these great dumps unhealthful to those, at least, living near them. It ought to be possible to determine with reasonable certainty whether this be true or not. In not a few cities considerable areas of such filled lowland have been subdivided and built up as residence sections. Carefully kept medical records should furnish presumptive evidence as to their healthfulness compared with other portions of the community. We say *presumptive* evidence, because any distinct unhealthfulness found in such a locality might be due to other causes incident to the original condition of these low or swampy lands, and wholly independent of the material used for filling them. But there are doubtless not a few cases available for study where such ulterior insanitary conditions do not exist. For instance, the city of New York has for many years deposited city wastes, including street sweepings, on a small island in the East River, covering its original surface to a depth of from twenty to thirty feet with such waste, and extending the island far beyond its original limits into salt water. Not only have workmen been constantly employed on this island, but a penal colony was established there several years ago and the inmates live there constantly. A careful study of the health-conditions of these people before and while living there should supply valuable evidence upon the question whether, and in what measure, the conditions are unhealthful.

Municipal expenditures for the conservation of the health and physical well-being of the public should primarily be measured by the dangers to be guarded against, or the benefits to be expected therefrom. Such expenditures can be based intelligently only upon facts established by scientific methods. If street dirt is a serious menace to the public health we should know definitely the character and extent of the danger, and take adequate measures to afford the best possible protection. If, on the other hand, street cleaning is warranted mainly by æsthetic considerations and the public comfort, that fact should control the extent and character of the work.

Your Committee believes that the time has come when united efforts should be made to settle all these questions by adequate scientific investigation and observation and the legitimate conclusions warranted therefrom. It, therefore, very strongly recommends that health officers and executive heads of street-cleaning departments should institute a systematic and thorough scheme of collecting and recording all the facts obtainable upon the following points:

1st. The relative prevalence of zymotic diseases among those constantly employed both upon the streets, as street cleaners, and those employed in the various operations of transporting and handling street wastes, as compared with the same classes of people engaged in other occupations, or as compared with the vital statistics of the city at large.

2d. The relative prevalence of diseases among those living in the vicinity of street refuse dumps, or upon ground filled in with such refuse.

3d. A careful, and sufficiently extensive bacteriological study of street dirt to determine the existence therein of disease germs, and the quantity of such germs in a unit quantity of street sweepings. We would further suggest that this would be an interesting and useful line of research for individual students in the field of sanitary exploration.

Your Committee would suggest that its successors should give special attention to the sanitary phases of the work assigned to it, and make a strong effort to collect and collate all the facts obtainable on the subject; and that, to this end, the street-cleaning and health authorities of all our cities be urgently requested to supply the Committee with all the facts relating thereto that may be in their possession, or that may be secured by such investigations as are herein outlined.

Respectfully submitted,

S. Whinery,
J. W. Paxton,
George H. Norton,
Charles O. Davis.

BOOK REVIEWS.

American Red Cross Text-Book on Elementary Hygiene and Home Care of the Sick.

By Jane A. DeLano, R. N., and Isabel McIsaac, R. N. P. Blakiston's Son & Co., Philadelphia. $1.00.

It is unquestionably the simplicity of arrangement and presentation which gives special value to the "Text-Book on Elementary Hygiene and Home Care of the Sick" just issued under the endorsement of the American Red Cross Society.

Reduced to an inviting size, and stripped of inessential detail, this volume is plainly written for the use of the untrained nurse or the housewife, or possibly for school use, rather than for the elementary study of one who intends to become a professional nurse.

After two pages of definitions of scientific terms which might not be familiar to the average reader, the authors give in the first four lessons a lucid and concise review of the general conditions on which health depends—"Bacteria and their Relation to Health and Disease," "Causes and Transmission of Disease," "Food, Water, Ice," showing sources of contamination, and setting forth precautions which may be taken; and a lesson in "Air, Ventilation, Heating, Lighting, Soil, Sewage, and Garbage."

The authors then enter upon a more detailed treatment of the hygiene of the dwelling-house, making recommendations about the location and arrangement of the house, and the care of each of its departments. This is followed by a chapter on "Personal Hygiene," which shows a careful selection of the chief essentials and a well-arranged concise presentation. Its brevity and attractive topical arrangement will probably induce many busy people who have balked at a longer technical treatise on the subject to read this with interest. "The Hygiene of Infancy and Childhood" is treated in the same practical way, definite application being its chief characteristic.

The rest of the little volume is devoted to subjects concerned with sickness and home-nursing. There are two chapters on "Beds" and "Bed-Making," treated in much detail. Following these are miscellaneous chapters on "General Considerations of the Care of the Sick in their Own Homes," "General Care of a Patient," "The Use of Simple Sick-Room Appliances, Local Applications, and Enemata," "Symptoms of Disease," and "The Household Medicine Closet."

This book is well-arranged, simple in style, and easy to read. It should serve equally well as a general elementary text-book for schools, or as a practical volume for one who has the care and management of a household.

F. H. C.

Forty-Third Report of Social Government Board of England and Wales, 1913-1914.

It is interesting to note that these reports have continued practically for the same period as that during which the American Public Health Association has issued Annual Reports. The Report in its wide review of public health conditions may be looked upon as in many ways the most complete of any report coming to hand. It presents most complete tables, beginning with those of infant mortality. It is remarkable that in a country with 80 per cent. of urban population, the year 1912 gave a death-rate of children under one year as low as 114 per 1,000. This rate has been reached in twelve years since 1901 when it was 150; while for all ages under five the decline has been from 54 to 32 per 1,000. When it is further seen that of the total, 23.6 per cent. were deaths from premature births, etc., the decline may be considered as little short of marvellous.

A large chapter is devoted to "Maternity and Child Welfare," and discusses ante-natal, natal and post-natal conditions and the work *official* and *social* devoted to these three branches.

In a paragraph dealing with "Reduction

in the Birth-rate," a very interesting and important table is given of eight classes of the population.

Classes showing the percentage decline in births and the decline of infant mortality in 1912 compared with the average of each for the whole country in the period 1886–90.

	Per cent.	*Rates of infant mortality. Per cent.*
I. Upper and middle classes	27	32
II. Intermediate class	19	15
III. Skilled workmen . . .	6	10
IV. Unskilled workers .	2	3
V. Textile workers . . .	31	22
VI. Textile workers	23	19
VII. Miners	42	28
VIII. Agricultural laborers . . .	1	22

The table would have been yet more satisfactory had it given the percentage population of each group to the total population since it would have pointed to a most important sociological fact, viz., the bearing which the several classes have upon the growth of natural prosperity. While the percentage rate of the mortality decline in the upper classes is greater than the birth decline, yet the importance to the nation of its superior classes socially showing so great a decline in the birth-rate is of very serious consideration. If this be compared with the notable increase of births of unskilled workmen with a notably less relative decline of the death-rate we see a phenomenon of the greatest sociological import. While the remarkable increase in the birth-rate in the mining population is accompanied by a similarly less relative decline in the death-rate, yet that the latter should only be 28 as compared with a relative birth-rate of 42 is extremely satisfactory, since the rate of feeble-minded in this population has been shown to be amongst the lowest of any group. Miners comprise 6.7 per cent. of the total male population.

The almost regular decline of deaths from scarlatina from 1901 to 1912 by 56 per cent. is very remarkable and illustrates the steady growth of notification and prompt removal to isolation hospitals. The same decline of 57 per cent. is seen in the deaths from diphtheria which has fallen to 0.12 per 1,000 while its sickness rate fell to 1.57 per 1,000 in London.

Typhoid fever has almost disappeared since there were but two deaths in every 100,000 population in 1913 for the whole country, while some districts of London had but 9 cases of sickness per 100,000. There were but ten deaths from smallpox, while not one occurred in London in 1913.

The deaths from pulmonary tuberculosis, which in 1901 had fallen by 50 per cent. in fifty years were 38,083 in 1912 while the rate had declined from 1.26 in 1901 to 1.01 in 1912 or just 20 per cent. The Report, while speaking of the amount of overcrowding where 1 in every 13 families in all England and Wales lived in a tenement of one or two rooms, and while further stating that overcrowding is seven times in urban as in rural one-roomed tenements says "There can be no reasonable doubt that, were it not for the greater use of hospitals in urban districts, the excess in their death-rate over that of rural districts would be much higher than at present." The Report amply illustrates the axiom of Dr. Herman Biggs that "Public Health is purchasable; within natural limitations a community can determine its own death-rate."

P. H. Bryce.

Lead Poisoning: From the Industrial, Medical and Social Points of View. *Lectures delivered at The Royal Institute of Public Health by Sir Thomas Oliver, M. A., M. D., M. R. C. P. Cap octavo, 294 pages, one infold chart. Cloth, $2.00, net. Paul B. Hoeber, Publisher, 67 and 69 East 59th Street, New York. 1914.*

This little book launches at once into the first lead industry of concern, viz., mining of lead-bearing ores, and thereafter devotes some 90 pages to a brief description of the various industries and trades which are chief seats of saturnism. The forms of lead, its portals of entry into the body, and its general symptomatology make up 75 pages more. Lead poisoning in its relation to female life, motherhood, blood pressure, urine, vital organs, and its presence in drinking water are next discussed. "What constitutes lead poisoning?"—is a subject paramount wherever workmen's sickness compensation obtains. Twenty-five pages are devoted to a résumé of preventive and curative treatment, the latter devoted largely to the double electric bath method of Oliver and Clague. Finally, the carefully drawn factory and workshop orders of the Home Office are given in full for the industries considered.

All is written in the simple, conservative, but forceful statements which characterize Oliver's style. The whole portrays the years of experience which the author has had with this subject in his capacity as expert for the Dangerous Trades Committee of the Home Office. The lectures make a most entertaining monograph upon a scientific subject, and quite intelligible, indeed, to the lay reader. With some exceptions, the book well encompasses its expected field (the industrial, medical and social points of view).

The section headlines, in many instances, have very little relation to the subject matter discussed within, but the index is compensatorily complete. Some important lead-hazardous industries are not discussed: Rubber manufacturing, babbitting, founding, tempering and others. Repetitions occur, but they are of an emphatic nature, and by no means detract from the value of the production. The bibliography is abbreviated. We are, however, inclined to trust the author's vast experience for much of the evidence and conclusions which he presents. He fails to give any heed to Blum and others who doubt that potassium iodide has any influence upon the elimination of lead. His evidence that lead may be skin absorbed is not at all conclusive. The discussion upon anemia is not complete either in blood findings or the influences which vasoconstriction may play. He makes little attempt to differentiate the various types of saturnism, to theorize upon idiosyncrasies, and to point out the various sequelæ of lead poisoning. The more recent blood tests, involving toxicity of the plasma are not taken up, nor are trophic, vaso-motor, and reaction-degeneration phenomena. The pathology (nerves, muscles, blood, blood vessels—the relation to aneurisms, etc.), as well as the differential diagnosis, could all be greatly extended. The principles of extending compensation to this affliction might well be included. His plea for the use of the electrolytic bath in curative treatment has received a severe setback in the more recent experiments of Goadby and Oxley (*The Lancet*, London, October 3, 1914), both of whom doubt that it was lead which Oliver's chemist found deposited upon his electrodes, and both of whom deny that the method had any eliminative or curative tendencies at all upon either men or animals. It is very probable, as their experiments appear to show, that dissociation of the organic lead compounds in the body and their dialyzability through an animal membrane (the skin), in any appreciable amount, are most remote possibilities.

However, many recent advances in the knowledge of the subject are given, such as Gardner's findings that surfaces coated with quick-drying paints yield carbon-monoxide gas. Oliver is not convinced that lead predisposes to tuberculosis to any noticeable extent, that, in itself it causes a positive Wassermann reaction, and, as well known, he deprecates the value of basophilia, while he adds new evidence of negative character concerning blood pressure determinations in the diagnosis of early forms of the malady. "Lead in the urine occupies the same relationship to saturnism as Koch's bacillus does to tuberculosis," etc. He considers its determination in the urine quite productive of results. Upon this point many investigators will not agree with him.

Practically, the book well fulfils its title, it illuminates many puzzling features, and should have a wide distribution among physicians, chemists, factory managers, economy experts, law-makers and hygienists.

Emery R. Hayhurst.

HEALTH DEPARTMENT REPORTS AND NOTES.

REPORTS.

Albany, New York.

The 1913 report of the Albany Bureau of Health is included in the report of the Department of Public Safety and is rather overshadowed by the more imposing bureaus of fire and police. Dr. Joseph D. Craig, the Health Officer, makes a number of excellent and well-planned recommendations which are in accord with the latest tendencies in public health work.

During 1913, Albany had an unusual and serious menace to health in the high water of the Hudson which not only inundated part of the city but also the water filtration plant. A serious typhoid epidemic ensued and was followed by an epidemic of smallpox, both of them being efficiently combated and promptly suppressed. The smallpox hospital has gained so favorable a reputation that little difficulty was experienced in the hospitalization of cases.

Improvements during the year include the appointment of a milk inspector and the passage of rules for the inspection of milk; the appointment of a medical inspector of schools under the Department of Education; the beginning of garbage collection and the appointment of a garbage inspector. Sanitary conditions in Albany have in some respects been very primitive in the past and have not set as good an example to the rest of the state as the capital ought to do. Apparently a wave of progress has set in however and it is to be hoped that Doctor Craig's plans and recommendations for improvements will meet with success.

The form of the report could be improved by the elimination of some of the tabular reports and the introduction of an attractive description of the work of the bureau and its aims so that the citizens, seeing what was being done and what members of the staff were doing it, might be more inclined to appropriate more money and employ more workers.

Colorado Springs, Colorado.

The Department of Public Health and Sanitation of Colorado Springs presents for 1913 its usual attractive report, made more attractive by numerous illustrations of the beautiful mountains and drives outside of the city. Dr. O. R. Gillett, Health Officer of the city, pleasantly recalls the meeting of the American Public Health Association there during the year.

Those who attended the meeting will be interested to hear that he has introduced still more vigorous measures for the suppression of flies in the form of an ordinance requiring that all garbage and manure be removed and the premises properly cleaned at least three times a week during June, July, August and September. Other improvements include the abolition of the roller towel; the suppression of the common drinking cup in churches as well as at public drinking fountains; and the sterilization of garbage before being given to animals which are subsequently sold for food. The contract for garbage removal now brings in a revenue of $1,440 in contrast to costing the city $1,200 a year as before.

Doctor Gillett points out with emphasis that the large number of tuberculosis patients who come to the city to recover does not increase the liability to infection of others in the community and shows that only one death from tuberculosis occurred among the regular residents. The contagious disease situation in general seems to be excellent although not quite as good as in 1912.

The reports of the work of the department are largely tabular but are neatly and concisely presented and add to the general excellence of the report

State of New York.

The First Annual Report of the New York State Public Health Council emphasizes the "new idea" in public health work-leadership rather than coercion.

The report covers the Council's activities since its creation in 1913 by the enactment of that state's new public health law. It discusses the important features of the Sanitary Code and gives in some detail the reasons for the enactment of the various sections.

Of course, leadership to be effective must be of the right kind. That the state is fortunate in having the right kind is evidenced by the list of members of the Council which consists of Dr. Hermann M. Biggs, Commissioner of Health; Dr. Simon Flexner, Director of Laboratories, Rockefeller Institute; Dr. T. Mitchell Prudden, Vice-President Board of Scientific Directors of the Rockefeller Institute; Mr. Homer Folks, Secretary of the State Charities Aid Association; Dr. Wilhelm Gaertner of Buffalo; Prof. Henry N. Ogden of Cornell; and Mrs. Ella L. Blair, Chairman, Public Health Department, General Federation of Women's Clubs.

The Council thus expresses the new idea of leadership in health work. "In the framing of this sanitary code, the Council steadily aimed to secure to the citizens of the state all the advantages which science and experience, especially during the last quarter of a century, have offered in the prevention of disease and in the promotion of the common welfare, with the least possible interference with the business, comfort and convenience of the people concerned."

The necessity for a state sanitary code as opposed to local codes is pointed out in the introduction to the report. The duty of enacting sanitary regulations had previously been exercised by 1,438 local boards of health. This made it possible to have that many kinds of health regulations. As a matter of fact, the Health Commission which framed the present health law discovered that many communities had no sanitary code. Most of the quarantine regulations were found to be obsolete and needlessly expensive and burdensome to the individual. Furthermore many of them had very little real value in the control of infectious diseases.

It is obvious, of course, that there can not be 1,400 different right methods of preventing disease and controlling epidemics; of farm sanitation and the preservation and protection of milk and other food supplies. Germs recognize no geography and are not controlled by city boundaries. No Chinese wall, even, could prevent the spread of epidemics.

Although this is so apparent to anyone with the slightest knowledge of health work and the principles of disease prevention, there is an occasional objection to the Council exercising what is called legislative functions. The objectors fail to realize, of course, that the principle is not new, and that if there is objection to conferring legislative powers in the enactment of sanitary regulations, there is less objection to conferring it on one board than on 1,400.

The Council states that it has attempted to enact a code that would be readily comprehensible to the citizens for whose use and guidance it is framed. In doing this it has eliminated not only useless sanitary procedures and "obsolete quarantine regulations" but has abandoned in its text those technical terms which, though still often used, have lost their earlier meanings and value.

"Thus the Council cherishes the hope," says the report, "that the Sanitary Code will prove to be effective, comprehensible and not unnecessarily rigorous in view of the large advantage to all which the adoption and enforcement of a more modern scientific code promises."

Seven chapters to the code have thus far been enacted. The first is entitled "Definitions and General Provisions"; the second relates to "Communicable Diseases"; the third to the "Production and Handling of Milk and Cream"; the fourth regulates the practice of midwives; the fifth relates to "Labor Camps"; the sixth to "Nuisances"; and the seventh enacts regulations relating to "Spitting; the Common Drinking Cup; the Common Towel; and Barber Shops."

In discussing the chapter on milk and cream the Council points out in its report that the regulations on this subject are especially important because milk, more than any other food, is likely, if improperly handled, to afford a breeding place and distributing medium for disease germs. Although the Council recognized the necessity of wise regulation of the production and sale of milk it endeavored to disturb the dairy business as little as possible.

"It was the sense of the Council," says its report, "that to obtain the best results in the production and handling of milk, discretion, tact and good judgment should be exercised, especially in the beginning, by the health officer in scoring dairies. It is believed that by this procedure not only the milk supplies of the state but the interests of the farmer may be safeguarded through such adequate pecuniary returns to him as the improvement in the quality of his milk may justify."

The same spirit is shown in the comment on the chapter relating to midwives. "The provisions of this chapter," says the Council, "are by no means adequate to meet the requirements of modern science and practice in midwifery. But in the absence of adequate facilities for the proper education of midwives in the state, these regulations seem to afford a reasonable temporary safeguard pending the organization of suitable training schools or systems of instruction."

In discussing the section relating to labor camps, the Council says it believes that these camp regulations, without imposing undue burdens upon private campers or those responsible for labor or construction camps, will safeguard the citizens of the state against pollution of water supplies and serious nuisances which are now not infrequent.

The Council describes its methods in obtaining information in its discussion of the seventh chapter of the code. Through the District Sanitary Supervisors the opinions of health officers and others throughout the state were obtained as to the necessity for the enactment of the regulation prohibiting spitting in public places, the common towel and drinking cup, and in regulating barber shop practices so that patrons may be assured of clean and sanitary conditions.

This chapter provides also that the utensils and instruments used by manicures and chiropodists shall be kept clean and sanitary, and that copies of the regulations shall be posted in all barber shops and places where manicuring and chiropody are done.

It was the almost unanimous opinion of health officers that these regulations should be included in the Sanitary Code.

Besides the enactment of the code, the Council, as required by law, has fixed the qualifications of directors of divisions in the Department of Health, sanitary supervisors and public health nurses.

DEPARTMENT NOTES.

Municipal Sanitation in Mississippi.

The Southern Medical Journal of February, 1915, publishes an article by Doctor Rowan of the State Board of Health dealing with the accomplishments of that organization during the last three years.

The following is his summary of results in terms of the things actually accomplished:

Results.

"This year, (1914) so far, 20.752 inspections of public service places have been made, and the number is increasing with each inspection. September alone showed 4,133 inspections by the assistant inspectors. Three years ago screened fruit was almost unknown; now practically 98 per cent. is screened during fly season. Then, there were but two whitewashed dairy barns in the state; now we have more than 400. Then only 48 cows had ever been tested for tuberculosis; now the number is more than 2.000. Then, there was not a clean, well-built slaughter house in the state; now nearly all are screened, whitewashed and otherwise sanitary. Then hotels and restaurants were often unscreened, with roller towels and common drinking cups evident everywhere; no you see them no more. The jails were vermin-laden and unclean throughout, and are not palaces yet, as we have found our supervisors and sheriffs hard to reach, but newspaper publicity of the past few weeks is working wonders here. Then railroads were sweeping in the presence of passengers; now they do their cleaning before they come over the state line. Then most health officers were inefficient and considered mere figureheads in their communities; now they are becoming a vital part of the community, because they are contributors to its betterment."

New York's Experience with Meningitis.

On July 1, 1910, the New York Board of Health took over from the Rockefeller Institute the preparation of anti-meningitis serum and now offers to physicians the assistance of experts for treatment of the disease. The diseases which the expert is called to examine are mainly epidemic meningitis or other purulent meningitides due most commonly to streptococcus and pneumo-coccus.

The Department is treating an increased number of cases each year and it is important to note that they have succeeded in decreasing the death-rate nearly one-half in the last two years. The treatment of these cases consists in quarantining the patients and those in contact with them who show meningococci in cultures from the nose and throat. In only four instances, however, has more than one case been observed in the same family. To each patient an intraspinal injection of anti-meningitis serum is administered. This is a specific immune serum of value only in combating meningococcus and then only when administered inside the membrane of the spinal cord. In making this puncture great care is taken as to the position of the patient. The serum is not forced into the cord rapidly and it is found that very little pain is inflicted. This serum is injected whenever the fluid drawn from the spinal cord is found to be cloudy. Usually four to six injections of 20 cc. are sufficient. Carriers are treated by swabbing the nose and throat two or three times daily with 20 per cent. argyrol.

The success of the New York Health Department in combating this disease seems to justify the expert use of anti-meningitis serum.

Dubois and Neal, *American Journal of Diseases of Children*, January, 1915.

Advocates Uniformity.

Dr. George T. Palmer, the president of the Illinois State Association for the Prevention of Tuberculosis, in a recent article has struck a very vital point—uniformity in anti-tuberculosis education. There are several agencies in the field, among them being The American Medical Association, State Boards of Health, local tuberculosis associations, sanatoria and public lectures, disseminating the "accepted truths" concerning tuberculosis. In the war against tuberculosis, many instances are known where the commonly-taught notions have not been able to stand up against the guns of experience and truth. The purely educational man has his definite views. The dispensary man, unaffiliated with sanitoria, has a different view from the man of the sanatorium who is not connected with the field work.

Local tuberculosis organizations should seek close coöperation with local health departments, medical societies, nursing associations and these bodies, in turn, with the state organizations. Annual conferences for education between the representatives of various state agencies would go far toward bringing about more uniformity.

Doctor Palmer's suggestions are:

"First, that there should be a uniformly adopted creed made up of the essential facts carefully chosen for the public, but sufficiently elastic to keep pace with the genuine additions to scientific truth.

"Second, that this creed should represent the views not only of educators and organization workers; but that it should represent the best thought of the sanatorium, clinical and social workers as well.

"Third, that the inability of all classes of workers to accept an alleged 'truth' should brand it as too uncertain for use in popular education.

"Fourth, that all of the various interests in anti-tuberculosis work should join together in furthering this most important campaign of education."

Whooping Cough.

A very attractive bulletin, entitled "Whooping Cough—A Dangerous Infectious or Catching Disease," has just been issued by Dr. G. W. Goler of the Health Bureau of Rochester, N. Y. The booklet is small, attractive, and very effectively done. On each page are at least four cuts of a little child in the midst of a coughing paroxysm, while in simple language and effective, bold-face type appear the history, cause, symptoms, effect and treatment of the disease.

A Unique Funeral.

The story of a unique funeral is told in the February number of the *North Carolina Health Bulletin.* The story is told by Dr. Henry Boswell of Mississippi, of the late L. M. Gross of that state who died recently of tuberculosis. He had contracted the disease at the age of 26, and, by reason of spending $5,000 and several years in searching for health via the patent medicine route, was pronounced incurable by a specialist to whom he finally went. He then posted himself thoroughly concerning the disease, and spent the last four years of his life writing for local papers and in preparing a bulletin on the disease from the viewpoint of the layman. Finally he planned his own funeral program and according to his own request a campaign was started at that time, the object of which was to secure the erection of a "first class institution in north Mississippi for the treatment of tuberculosis."

Social Hygiene.

According to *The American Social Hygiene Association Bulletin,*

"*The Public Health Report* of the United States Public Health Service, January 29, 1915, lists for the first time in its department 'Prevalence of Disease' reports of gonorrhea and syphilis. These first reports are from Louisiana, for December, 1914."

Some of the bills pending before the various state legislatures, having to do with social hygiene considerations are:

"Bills requiring a medical certificate for marriage: South Dakota, Vermont, New York, Indiana, and Missouri; Oregon and Wisconsin amending existing laws.

"Injunction and abatement bills: Missouri, Michigan, Indiana, and New Hampshire.

"A bill penalizing transportation for immoral purposes within the state: Wisconsin.

"Penalizing the keeping of bawdyhouses: Wyoming.

"Maintenance and support of bastard: Missouri.

"Sterilization of certain classes of insane, feeble-minded, and defective persons: Nebraska, Washington, Iowa, and Missouri.

"Pandering: Washington and New Hampshire.

"Prohibiting quack advertisements for cure of venereal disease: New York.

"Requiring venereal diseases to be reported: New Hampshire."

New York's Infant Mortality.

The following extract from the New York Health Department's *Weekly Bulletin* of February 20, is most interesting:

"The infant mortality rate for New York City for 1914 is the lowest in the history of the city. The decrease in this death-rate has been regular and persistent since the Bureau of Child Hygiene of the Department was organized and since infant sickness and death were recognized as a public health problem of the first magnitude.

"A brief survey of the mortality rates since the organization of this bureau is of interest in showing what must be the trend of future work if good results are to continue.

"In 1907 the death-rate under one year of age was 144 per thousand births: in 1914 it was 94.6 per thousand births. An analysis of these figures follows:

	1907. Per cent.	1914. Per cent.
Diarrhœal diseases	31	22
Respiratory diseases	21	22
Congenital debility	32	42
Contagious diseases	4	4
All other causes	12	10
Total deaths	100	100

"As may readily be seen by the above table, the greater part of the reduction in infant mortality has taken place in that class of diseases known as diarrhœal. The respiratory diseases show a slight increase. The deaths from congenital debility show a marked increase from 32 per cent. to 42 per cent. of the total deaths, the contagious diseases remaining the same for the two periods.

"While not abating its efforts to reduce infant morbidity and mortality from diarrhœal diseases, it is evident that the program of the Bureau of Child Hygiene for the future must include increased and far-reaching efforts to reduce the present death-rate from congenital debility and respiratory diseases, if the decrease in the infant death-rate is to continue, or even if the present infant death-rate is to be maintained.

"The accompanying table shows the death-rate of infants under one year of age in the ten largest cities in the United States for the year 1914 per thousand births reported."

New York	94.6
St. Louis	103.3
Boston	103.7
Pittsburg	115.2
Cleveland	116.4
Philadelphia	117.6
Buffalo	121.5
Detroit	122.4
Chicago	132.7
Baltimore	154.6

Cincinnati School Inspection.

In an enlarged weekly bulletin Vol. 6, No. 8, of eight pages, the Cincinnati Board of Health gives a very interesting account of the history of school medical examination during the last six or seven years in that city. So successful and beneficial has it become now that "those most active in their opposition (at first) are now correspondingly earnest in their words of commendation." The amazingly large number of phases which the work has assumed and the large number of children treated have seemingly justified many times all of the time and labor which the work has demanded. Health officers will find this report quite comprehensive and instructive.

Will Train Health Officers.

"Believing that the greatest need at the present time of the State of North Carolina is trained health officers, Dr. W. S. Rankin, Secretary of the State Board of Health of that state, has devised a plan which will be put into execution at once, whereby he will train men for this important work. At the present time there are more than a dozen counties in the state where full-time county health officers could be employed, but there are no men available for the work. Doctor Rankin believes that by taking intelligent physicians and putting them through a six- or eight-months' course of special training, he can produce health officers who will be equal or superior for his purposes to those training in some of the professional schools. The following is an outline of the course which he proposes:

"(a) State Health Administration or State Health Laws and Policies, four weeks. During this course the apprentice is assistant to the executive officer of the Board, answers as much of the official mail as he can, and is referred to and quizzed upon the proper literature.

"(b) Vital Statistics, four weeks. Actual experience is given in every phase of the work of the Bureau of Vital Statistics, is referred to proper references on Vital Statistics and is required to study and criticize the vital statistics table appearing in various reports.

"(c) Popular Sanitary Education, three weeks. Preparation of articles for the Bulletin and press service, study of exhibits, slides and lanterns, and as assistant to the Bureau Chief.

"(d) Tuberculosis, four weeks. During this time the apprentice assists at the State Sanatorium and in the Bureau for Tuberculosis and is assigned proper reading, with quizzes upon it.

"(e) Laboratory, four weeks, including with the routine examinations of the State Laboratory and quizzes on the interpretation of water analysis and upon epidemilogical procedure.

"(f) County Health Work, six weeks. During this time the apprentice will serve as assistant to an efficient county health officer and will be sent to see special phases of county health work in different counties.

"On completion of this six or seven months' practical course, a certificate of proficiency in public health work signed by the President and Executive Staff of the Board will be given the apprentice."

Journal of the Outdoor Life, March, 1915.

Must Know Demography.

"Surgeon-General Rupert Blue of the United States Public Health Service recently announces that hereafter all candidates up for examination on the corps of physician will be asked a set of questions on vital statistics and demography. The statistics will comprehend those of population, conjugal condition, birth, morbidity, and mortality, including special questions on life tables. Commenting on this step, Surgeon Blue says:

"'We feel that the relationship of the practising physicians to the registration of births and deaths and to the reporting of notifiable diseases is such that we may properly assume that a man who has been graduated in medicine and is ready to enter practice is familiar with the essentials of demography.'"

Journal of the Outdoor Life, March, 1915.

Street Cleaning in New York.

The importance of street cleaning in the sanitation of a city makes the practical side of this problem of public health interest. *Municipal Engineering* for January, 1915, contains a brief account of the process as it is carried on in New York City.

In 1913 the street-cleaning department, New York City, had an appropriation of $8,403,205. This was to pay the expenses of cleaning streets and removing ashes, rubbish, street sweepings and garbage as well as snow and ice in winter.

In this work the city is divided into districts; each district has 624,864 square yards of pavement with a daily cost of cleaning of $238.52. The cost of hand sweeping is thirty-eight cents per 1000 square yards or $3.07 per cubic yard of sweepings. The complete cost of removing of dirt by this method is fifty-two cents per 100 square yards.

Other methods for cleaning the streets have been adopted with the following results: Street cleaning with the Merritt Sweeping machine costs the city forty-one cents per 1,000 square yards; with the Emerson Vacuum cleaner it costs forty-three cents per 1,000 square yards. Flushing the street by means of hose attached to a hydrant costs sixty-five cents per 1,000 square yards although this flushing can be done by the use of "Flushing Machines," operated by means of compressed air, at a cost of thirty-nine cents per 1,000 square yards. The use of this machine provides the most thorough and economical method of street cleaning thus far employed.

Chicago Street Car Investigation.

A series of investigations on the street cars and elevated trains of Chicago have been made by the Department of Health of that city. Upon securing an amendment of the city ordinances relating to the control of the heating and ventilating conditions of elevated trains, air samples were taken in 220 cars and it was found that in 150 of these cars, the presence of carbon dioxide was far in excess of the standard set by the ordinances. Action is to be taken in regard to these violations.

The failures to operate ventilating fans when the conditions need it, have been enormous—over 1,000 reports of failure accumulating in a short time.

Bacteriological examinations of the straps used by standing passengers in street cars were made. A large number of bacteria were present but, except in isolated circumstances, they were of little sanitary significance. A comparison was made between the number of bacteria found on leather and celluloid straps. The average number of colonies on blood serum plate showed 14 from the celluloid straps and 136.6 from the leather straps.

Frauds in Sales of Disinfectants.

The public is beginning to realize that one of the most serious humbugs of which it is the victim is the sale of disinfectants which are either entirely worthless or of very doubtful value. This is a matter not only of dollars and cents, but of life and death. It is believed that thousands of lives are sacrificed in the United States every year because the laws in most states permit the sale of disinfectants which do not disinfect.

It is quite evident that state control of disinfectants is as vital to the public welfare as enforcement of the pure food laws. Yet the law as it now stands in every state except Maryland permits the market to be flooded with preparations which have no efficiency whatever in killing disease germs. Many of the most widely advertised disinfectants are, it is charged, practically devoid of effect on germs and wholly so when diluted as recommended by their manufacturers.

To remedy this situation in New York State a bill is to be introduced at the next session of the Legislature to standardize disinfectants and place their manufacture and sale under strict official control. The proposed law will require every disinfectant made or sold in the state to bear a label stating its power over germs as compared with that of pure carbolic acid.

Pacific Pharmacist, January, 1915.

Health Department and Public Library Coöperate.

One of the measures adopted by Washington, D. C., in looking after the health of its babies, involves an interesting form of coöperation between the health department and the public library. A practical and compact little pamphlet entitled "How to Keep Your Baby Well" is sent out by the health department to each mother upon the report of the birth of her child. In a second edition of this pamphlet which has recently been issued there appears a section on "Books that Mothers Ought to Know," in which mothers are told that they can obtain at the library the best books on the care of babies. It is stated that the library has many copies of books of this kind which may be borrowed entirely free of charge, and some of the standard volumes are mentioned. The requirements for taking out a library card are also made simple by means of a few practical instructions.

The Amcriean City, February, 1915.

Relative Values of Improvements Affecting the Sanitation of Villages.

The Ohio State Board of Health published a paper by W. H. Dittoe, Chief Engineer of the Board, in the October, 1914, *Bulletin* which is worthy of attention. It deals with the appropriate expenditure of money in small towns or villages but the facts are certainly applicable to larger municipalities.

Mr. Dittoe writes as follows:

"Each year a vast sum of money is expended for the installation of municipal improvements. Frequently the expenditures are made without serious thought and study to determine the relative benefit to be derived, and as a result it is found that the financial assets of the community have been depleted and the maximum benefit has not been secured. In other words the funds have been misspent.

"The principal improvements made by a municipality, particularly the small village, may be classified under three general headings as follows: (1) Improvements for the promotion of public health and sanitation; (2) Improvements for the promotion of safety and convenience; and (3) Improvements for the promotion of education and social betterment."

Mr. Dittoe shows that improvements belonging in the second and third divisions have frequently caused the expenditure of sums of money altogether out of proportion to their importance, and left the municipality without funds for much needed water works or sewerage systems.

The local health official is looked upon by Mr. Dittoe as being the one to exert influence to prevent this condition. "He should strongly oppose the extravagant expenditure of public funds for improvements to promote convenience until adequate provision for the promotion of the public health has been made by the installation of a satisfactory public water supply and sewerage system. He should endeavor by conferences with the village officials and citizens to bring about the realization of maximum benefits to the community."

PUBLIC HEALTH NOTES.

Steam Disinfection for Sewage on Common Carriers.

"Live steam for sewage disinfection is employed in a device suggested by Prof. E. B. Phelps, and designed by Leslie G. Frank both of the United States Public Health Service. The apparatus is described by Mr. Frank in the January 1 issue of the *Public Health Reports*.

"The device is for use on railway coaches which pass over watersheds, and on vessels which, according to findings of the International Joint Commission, have been responsible in large measure for the pollution of the Great Lakes near the intakes of municipal water supplies."

The apparatus consists of a tight insulated tank having influent and effluent pipes for the sewage and an influent live steam pipe. The steam pipe is fitted with a valve operated by a float which rises and falls with the level of the sewage in the tank. The heights at which steam is turned on and off may be easily predetermined.

Mechanically and bacterially the efficiency of the process is practically 100 per cent. The cost of installation is not known; of the apparatus alone it will be about $15 to $20 per railway coach. The cost of operation per tank per coach per day is estimated at 1½ cents.

Public Health Work Among the Indians.

The work of the United States Indian Medical Service is very briefly described by Dr. Joseph A. Murphy in *The Survey* for January 23. The difficulties which the Indian problem presents are probably greater and more numerous than in any other. Doctor Murphy says, in his introductory paragraph, "Ignorance, superstition, ancient habits and customs, indifference, poverty, unfavorable environment, lack of knowledge of the English language, and frequent lack of industrial ambition—all have to be combated in order to effect any marked or permanent improvement.

"The great majority of Indian homes are extremely insanitary, the principal defects being lack of cleanliness, lack of light and ventilation, overcrowding, improper disposal of refuse and excreta, improper care of sick and infants, improper protection or preparation of food, and the neglect of isolation of communicable diseases."

Under such conditions, it is no wonder that all communicable diseases flourish. Tuberculosis and trachoma are the most prevalent, and are greatly in excess of those among the white race. Practically all children are reared in the presence of one or more cases of tuberculosis, resulting in almost universal infection in early childhood.

The trachoma problem is very serious, and the disease is difficult to check. Of 39,231 Indians examined, 8,940 were infected—22.7 per cent. About 20 per cent. of all Indian pupils entering school are infected.

"The work of combating these diseases is under the immediate direction of the commissioner of Indian affairs. For the 300,000 Indian wards of the government there are now employed under him 200 physicians, 80 nurses, 7 dentists, 70 field matrons, and 77 miscellaneous hospital employees. There are 49 hospitals with a total capacity of 1,249, and 4 tuberculosis sanatorium schools with a combined capacity of 250." Approximately $400,000 has been appropriated during the present (1914) fiscal year.

The problem is being attacked in three ways—(1) by the provision of hospitals and sanatoria, (2) by efforts to better the industrial and economic status of the Indian and (3) by educational methods. The last is the most important and is receiving the greatest attention. Particular efforts are being made in the schools, and "great stress is being placed on the practical teaching of hygiene and the prevention of disease."

Coyotes and Rabies.

"The spreading of rabies by infected coyotes among cattle grazing in the national forests has assumed a grave aspect, according to a report received by the forest service from the district forester in charge of the forests in Washington and Oregon. Numerous townships in eastern Oregon, it is reported, have ordered that all dogs be muzzled, lest those that have been bitten by rabid coyotes develop hydrophobia and attack human beings or domestic animals. Efforts are being made by the state authorities of Oregon to stop the spread of hydrophobia by this means and officers of the forest service are coöperating in attempts to kill off the coyotes. In one country alone a loss of three hundred head of cattle is charged to rabid coyotes."

Science, February 5.

New York State Tuberculosis Campaign.

"The earthworks of the worst enemy of the human race, tuberculosis, are being valiantly stormed in New York by regiments of physicians and laymen under the efficient leadership of officers of the State Department of Health.

"The plan of campaign, as briefly outlined by Edward A. Moree, advisory expert in public health education, involves:

"1. Employment by city, town, and village health boards of visiting nurses to work under the direction of the health officer.

"2. Establishment of dispensaries by health authorities of the larger cities and villages for the examination of suspected cases.

"3. Establishment of open-air schools for anemic and sickly school children predisposed to the disease.

"4. The efficient medical examination of school children for the discovery of early cases of the disease and for the removal of adenoids and enlarged tonsils, and for the discovery of other physical defects.

"5. Most important of all, the establishment of tuberculosis hospitals by county boards of supervisors for the cure of early cases and the segregation of advanced cases."

The Modern Hospital, February, 1915.

Anticholera Vaccination.

In an article by C. Dopter in *Paris Medical* for February 2, stress is laid on the efficiency of this procedure, as shown in the Balkan wars. Arnaud reported that whereas the incidence of cholera among 14,332 unvaccinated officers and enlisted men was 5.75 per cent., among 21,216 men vaccinated once was but 3.12, and among 72,652 men vaccinated twice, 0.43. In the civil population of Greece, Cardamatis reported analogous percentages of 2.12, 0.26, and 0.01, respectively. The vaccine used in these cases had been prepared at the Pasteur Institute in Paris and consisted of cultures on agar heated to 60° C. for one hour. Dopter considers three injections at five-day intervals essential if immunity is to be acquired. Doses of one, 1.5, and two cc., respectively, should be administered in succession.

New York Medical Journal, February 20, 1915.

Active Immunization of Hay Fever.

It has long been known that hay fever with its characteristic itching of the eyes, sneezing, serous discharge from the nose, obstructed breathing and itching of the palate and face is caused by the action of the pollen grains from such plants as timothy, redtop, bluegrass, ragweed and goldenrod which are carried by air currents and thus inhaled. Recent investigations show that the pollen acts like other protein compounds when injected into the blood and consequently we may expect the laws regarding immunity from protein poisons to hold true for this disease. Some people are much more susceptible to the disease than others and this susceptibility is often passed from one generation to another as an hereditary trait.

The *New York Medical Journal* of February 6, 1915, prints a preliminary report concerning methods of immunization for this disease. Pollen extracts were made from some of the above-mentioned plants and introduced subcutaneously in small amounts before the hay fever season. Of six cases thus treated one was cured for the season, four exhibited very mild symptoms and one was not improved. Five cases were treated during the season of which four showed rapid recovery. It is believed that the two cases which resulted unfavorably did so because of irregular treatment.

One case was rapidly cured by injecting a large quantity of immune serum made from the blood of a person previously immunized by the former method.

The work done thus far would lead us to believe that, as the technic for securing pollen extract is improved, immunity for this disease can be readily produced by one or two courses of treatment, and that evidence of sufficient immunity can readily be secured by the complement fixation test or by an examination of the "wheal" produced by skin scarification.

The Value of Blood Pressure Readings and Examination for Life Insurance.

The Louisville *Medical Journal* for February, 1915, contains an article which sets forth the experience of the Northwestern Mutual Life Insurance Company with blood pressure readings. The article is written by the medical director of the company and seems to show that the addition of these requirements in testing applicants for insurance has resulted very satisfactorily.

The examination of nearly 20,000 people between the ages of 15 and 60 has shown that the blood pressure varies from about 120 to 135 mm. according to the age of the person, the average being 128.91. By dividing the people thus examined into classes according to the systolic pressure and following the life history of each case definite evidence has been obtained concerning the relationship of blood pressure to the expectancy of life.

The author draws the following conclusions:

"First. A persistent systolic pressure of 15 mm. above the average for any given age should at least excite suspicion and call for further careful study and painstaking investigation.

"Second. Applicants of all ages with a persistent systolic pressure above 150 mm. show a mortality higher than normal. The mortality increases as the pressure increases and also becomes greater progressively with the time of exposure.

"Third. The deaths of such applicants as had a high systolic pressure at the time of examination were caused, as might be expected, to a large extent by such diseases as apoplexy, arteriosclerosis, organic heart disease and nephritis."

Child and Infant Hygiene.

The January number of the *Journal of the Royal Sanitary Institute* is largely given over to reports from the sections on "Hygiene of Infancy and Childhood at the Blackpool Congress." In the president's address, Professor Kenwood points to some recent achievements in anti-natal and infant hygiene and suggests that this important work should cease to be sporadic and that a general plan should be adopted for carrying it forward. He believes that training for motherhood should begin by the teaching of elementary hygiene in the schools and that special teaching should be provided through infant care centers for young adult women and expectant mothers. Again the medical men and midwives should devote more time to the study of infant hygiene than at present and more should be expected of them in the way of educating the public.

Doctor Nankivell, in discussing the care of children, gives the following classifications of the causes of disease and mortality:

"A. Pre-natal influences: (1) Poorness of stock; (2) Inherited disease or tendency to disease; (3) Causes leading to premature birth.

"B. Post-natal influences: (1) Ignorance or indifference of parents; (2) Poverty of parents; (3) The later effects of neglected infantile condition; (4) Insanitary surroundings; (5) Infectious diseases and their sequelæ."

He continues with a discussion of the means of preventing these conditions from which he draws the following conclusions:

"(1) A certificate of health should precede marriage; (2) The notification of pregnancy is desirable; (3) Extended teaching should be given to schools on the subject of domestic hygiene; (4) The present scope of schools for mothers, of children's consultations, and of health visiting should be enlarged to include all children who are under school age."

A Review of the Work on Tuberculosis in Children.

An article of some 30,000 words appears in the *American Journal of Diseases of Children* for February, 1915, which summarizes practically all of the important articles which appeared during the past year dealing with tuberculosis in children and gives a complete bibliography of the subject.

The article was written by May Michael, M. D., and gives in concise form the results of investigation concerning the portals of entry, bacteriology, diagnosis, symptomatology, prophylaxis treatment and modifications of the disease.

Sensitized versus Nonsensitized Typhoid Bacteria in the Prophylaxis and Treatment of Typhoid Fever.

An article on the above subject by Dr. A. L. Garbat appeared in the *Journal of the American Medical Association* of February 6, 1915. A brief extract of this article follows:

"—By sensitization is meant the mixing of an antigen (bacteria, red blood cells, proteins, etc.) with its specific antibodies, these antibodies being found in the serum of an animal which has been previously immunized with the particular antigen. The inoculation of dead typhoid bacteria (ordinary vaccine), as a prophylactic measure against typhoid fever is now well recognized. If such vaccine causes mainly a bacteriolytic reaction, and sensitized vaccine mainly a bacteriotropic response, would it not be well in prophylactic immunization to inoculate with both varieties? In this way a combined form of immunity would be obtained. The dose of typhoid vaccines for therapeutic purposes is far from definitely established; as a rule, bacteria can be given in much larger doses when sensitized than nonsensitized. In the series of cases reported, 500 million of sensitized bacteria were employed as the standard dose, both for the first and subsequent inoculations; though, naturally, one had to be guided by the severity of the illness, age of the patient, and reaction from the inoculation. From the results observed, the conclusion is reached that the treatment of typhoid with sensitized bacteria offers a more rational therapy from an immunological point of view than that by ordinary nonsensitized vaccine. The repeated inoculation of large doses, even in very ill patients, was not attended by any harmful effects or a distinctly negative phase; the general course of the disease seemed milder and complications less, while the crisis in the infection took place in but a small proportion of cases; the improvement usually being gradual."

New York Medical Journal, February 20, 1915.

People's Laundry to Supplement Public Baths.

The important function of the fourteen free public baths in New York City which had an attendance of four million in 1914 is well known. Realizing the difficulty of the poor in securing clean clothes, the Bureau of Public Health and Hygiene of the Association for Improving the Condition of the Poor has recently established two institutions to supplement the public baths.

With the Bureau of Public Buildings they have established a public wash house on West 28th street where for a nominal fee women may come and wash their clothes in clean and attractive quarters. The second enterprise carried on with the Department of Social Welfare was the establishment of the Milbank Semi-public Wet Wash which washes thirty pounds of white clothes for twenty-five cents, ten cents more being charged for collecting and delivery. The patronage of this laundry is rapidly increasing and its efficiency as a public health measure may be realized when we know that among fifty-three thousand people in the Hudson bank section, 99 per cent. of the families were without baths, 45 per cent. without wash tubs and 94 per cent. without hot water.

The Modern Hospital, February, 1915.

A Rare Newspaper.

The New York *Tribune* has recently adopted the seemingly rash policy of guaranteeing its readers against loss from accepting at its face value the matter in its own advertising columns. This policy is apparently aimed especially against the fraudulent patent medicine industry. The *Tribune* is a leader among newspapers in assuming this stand but as it itself predicts, it is not likely to stand alone long.

Alcohol and Iodine as Germicides.

The New York Medical Journal of February 13, 1915, published a report of some experiments made by Albert Comstock, M. D., in comparing the efficiency of alcohol and iodine as germicidal agents.

The organisms experimented with were B. subtilis, B. anthracis, B. coli communis and Staphylococcus pyogenes aureus and the solutions used were 95 per cent. and 70 per cent. ethyl alcohol, U. S. P. tincture of iodine, equal parts of iodine and alcohol, tincture of iodine and water in equal parts. In summarizing his results the following deductions may be made:

1. Aside from a solvent and cleansing agent, alcohol is not an antiseptic of value although the weaker solutions possess more antiseptic value than the stronger.
2. Iodine either in the tincture or equally diluted by alcohol or water is a very efficient germicide. It is interesting to note that the iodine works equally well when diluted with water.

The Home Hospital Experiments for Consumptives.

Publication No. 84 of the New York Association for Improving the Condition of the Poor gives an account of an interesting experiment in treating consumptives without breaking up the unity of the family. A summary of the experiment follows:

The Home Hospital experiment undertaken by the New York Association for Improving the Condition of the Poor was established to show that with better housing conditions, reasonable segregation and more adequate medical and nursing supervision, tuberculosis could be (1) prevented from spreading to the well members of a family, (2) cured in many incipient cases and (3) improved in the more advanced cases; larger earnings could be gained and the family could be rehabilitated physically, economically, and socially. At the end of two years the Home Hospital comprised forty-eight apartments, four of them used for administration, situated in the East River Homes, 78th Street and John Jay Park, New York City. Those families were chosen in which both poverty and tuberculosis were incipient and where under other treatment the home would be broken up. Sixty-two families, including 207 patients and 113 well members, have come under the supervision. Before discharge sanitary homes and proper employment are secured for the patients. The results of two years of the experiment have shown the desired ends, with a cost less than treatment which involves sending the members of a family to sanatoria, preventoria and orphan asylums. It attacks the problem of tuberculosis with the family as the unit and opens up a new field for the control and prevention of the disease.

Tuberculosis Sanatoria.

According to the report of the Advisory Commission of the Minnesota State Board of Health, the various states rank as follows in regard to the number and character of sanatoria for tuberculosis patients within their borders:

Pennsylvania leads in the work with 114 county sanatoria and 3 state sanatoria. New York has 12 county sanatoria in operation and has made levies for 15 more. It has 1 state institution.

Massachusetts has the largest number of state sanatoria, having 5, with capacity of 1,100, and it has 32 city sanatoria with a capacity of 1,359. Connecticut has 4 state and 5 city sanatoria. Ohio has 20 county institutions; Wisconsin has 8 in operation and 1 levy being made; California has 5 city sanatoria; Indiana and Iowa, 4 county sanatoria; Kentucky has voted 4 levies; Michigan has 3 in operation and taxes levied for 3 more; New Jersey has 5, Illinois 2, and Texas is now building 5. California, Illinois and Kentucky have no state institutions and there are fourteen states without any county or city sanatoria in operation.

Public Health Gardening.

In 1913 the Philadelphia vacant lot gardening movement cost $7,261 and the gardens under cultivation produced, it is estimated nearly $28,000 worth of garden crops. Not only that, but these same gardens contributed materially to the better living of hundreds of families, and to their increased health, education and pleasure. In short, the plan as thus tried has been an unqualified success and in addition to the benefits already noted has had a wholesome civic influence not only in Philadelphia, but in other cities that have been influenced to experiment along similar lines.

Press Service, Chicago Department of Health.

A Re-organized Service.

Especially worthy of observation is the re-organized and rejuvenated campaign for better health which has been inaugurated in Minnesota since the situation there was investigated at the request of the health department by the United States Public Health Service. Public education by means of pamphlets, news letters, cartoons and the like is being properly emphasized. Dr. H. W. Hill, formerly Director of the Institute of Public Health in London, Ontario, is now the Executive Secretary of the Minnesota Public Health Association and under his supervision great things will doubtless be accomplished.

Osler's Challenge.

Sir William Osler, writing in the *American Magazine*, throws down the following challenge to the anti-vaccinationists.

"A great deal of literature has been distributed casting discredit upon the value of vaccination in the prevention of smallpox. I do not see how any one who has gone through epidemics as I have, or who is familiar with the history of the subject, and who has any capacity left for clear judgment, can doubt its value. Some months ago I was twitted by the editor of the *Journal of the Anti-vaccination League* for 'a curious silence' on this subject. I would like to issue a Mount-Carmel-like challenge to any ten unvaccinated priests of Baal. I will go into the next severe epidemic with ten selected, vaccinated persons and ten selected unvaccinated persons—I should prefer to choose the latter—three members of Parliament, three anti-vaccination doctors, if they could be found, and four anti-vaccination propagandists. And I will make this promise—neither to jeer nor jibe when they catch the disease, but to look after them as brothers, and for the four or five who are certain to die, I will try to arrange the funerals with all the pomp and ceremony of an anti-vaccination demonstration."

A National Employment Reserve for Lean Years and Seasons.

Mr. N. I. Stone, chief statistician of the Wage Scale Board of the Waist and Dress Industry in New York, advances a plan for a reserve to employ idle workmen on various national works. Mr. Stone's article, appearing in *The Survey* of January 23, 1915, is appropriate at this time when the working men are suffering from want of occupation.

The proposed plan provides for a system, likened to the new Federal Reserve Banking System, which is to care for surplus laborers as the banking system does for surplus money. This surplus labor is to be utilized on public works, such as the building of roads, draining of swamps and other reclamation work and the like. Nationwide coöperation is looked for, and states and other municipalities are expected to assist in the utilization of this labor in their own undertakings.

Mr. Stone gives figures to show the loss to the country due to unemployment, and it reaches the enormous sum of about three billion dollars. There are additional other losses which it is impossible to estimate but whatever the total may be, it must be borne by society as a whole. The suffering workers must draw on their own savings, upon charity and society through various agencies. The proposed plan is to prevent this waste and loss by providing a well-organized comprehensive scheme of unemployment insurance.

As many public health problems are greatly affected by the economic condition of the people, any plan which prevents needless waste and tends to improve financial conditions will also assist health work.

INDUSTRIAL HYGIENE AND SANITATION.

A Bulletin Concerning Industrial Hazards and Occupational Diseases.

In February the Ohio State Board of Health issued a 438-page bulletin dealing with the above subject. The bulletin includes a discussion of legislative enactments, the general principles of industrial hygiene, the common industrial health hazards such as dust, heat, fatigue, germs and poisons, specific health-hazardous processes, occupational diseases and measures of preventions.

The report was prepared by E. R. Hayhurst. It is exhaustive and gives a careful summary of industrial conditions in Ohio. The corrective measures to be recommended fall under three general heads:

1. Information, education and publicity.
2. Corroboratives of industrial health hazards and occupational disease.
3. Coöperative legislation.

All students of occupational diseases should obtain a copy of Doctor Hayhurst's report. It is one of the most valuable contributions to this important branch of public health work ever issued.

Factory Construction in Large Cities.

Safety Engineering, January, 1915, publishes an article by E. G. Perrott describing some of the recent advances in the mode of factory construction in Philadelphia. Among these he mentions the substitution of full-fledged stairs enclosed in brick walls for the outside fire escape, the use of the automatic sprinklers, the substitution of reënforced concrete for wood or slow-burning wall material and the use of cement finished floors in warehouses and buildings. Many of the advantages of concrete for construction purposes are pointed out. It allows for more window space, gives greater firmness, is capable of taking a highly ornamental finish and a white coat may be applied directly on the concrete surface instead of plastering the interior of the building.

Safety from the View Point of the Workman.

The attitude of workmen toward industrial accidents is brought out in a recent article by George Sheppard of South Works, Illinois Steel Co.

The beginning of the safety first movement was marked by indifference on the part of the employees, if not by distrust; but the appointing of workmen upon safety committees and their further enlightenment upon the subject have made them ardent supporters of the plan. Men who are unnecessarily careless are reprimanded by their fellow workmen and it is considered a disgrace to be involved in accidents due to carelessness. Since 70 per cent. of the accidents that do take place are still directly the result of carelessness in opposition to the 8 per cent. that are unavoidable, the importance of securing this attitude among employees becomes apparent.

Safety Engineering, January, 1915.

Occupational Disease and Public Health.

A very good article on Occupational Disease and the Public Health by Dr. Donald B. Armstrong, Director of the Department of Social Welfare, New York Association for Improving the Condition of the Poor, appeared in the Boston *Medical and Surgical Journal* of January 14, 1915. Drawing his examples and statistics from conditions in Rhode Island he shows conclusively the immediate relation between occupational disease and public health. He says that from the national standpoint the factors of control are:

1. A thorough-going scientific labor law.
2. The coördination of authority.
3. Honest enforcement of the law, including an adequate system of factory inspection.
4. Effective educational work.
5. An adequate system of reporting industrial disease.
6. A sickness and accident compensation system.

Quoting from an editorial in a recent issue of the *Journal of the American Medical Association*, he says:

"Abbe (Zeiss Optical Works in Germany) kept a careful record for the years when the plant was operating on a nine-hour day. When the working day was reduced to eight hours the record showed the men earned over 3 per cent. more than during the previous years, the output of the works was increased 3 per cent. and the power plant was able to shut down an hour earlier, thus affecting a very material saving in the fundamental expense. The record was for 233 men of 31 years and many different occupations on a piece-work basis were represented in the shop.

"Both employers and employees need to be convinced of the evident fact that the healthy man is the most efficient and the cheapest employee and that any reasonable expense to maintain him in health is a profitable investment."

Coal Mining Accidents.

Two thousand four hundred and fifty-one lives were lost during the year just passed in American coal mines. This is 334 less than the number for 1913.

"Coal mining in 1914," says Van H. Manning, Acting Director of the United States Bureau of Mines, "cost the lives of 3.3 men in every 1,000 employed, while in the year 1913, the death-rate was 3.73. That reduction alone means a saving of more than 300 lives.

"The number of miners killed for every one million tons of coal mined in 1914 was 4.81. In the year 1913, there were 4.89 miners killed for every one million tons mined. With the exception of the year 1912, the 1914 rate is the lowest yet recorded for the United States.

"The amount of coal produced for each miner killed in 1914 was 208,078 tons, which is the largest amount on record with the exception of the year 1912.

"There were 316 lives lost in disasters in which more than five men were killed, which is a reduction of 148 deaths when compared with the disasters of 1913.

"When the Bureau of Mines began its work, the great cause of great disasters in the coal mines of the United States was the explosion of coal dust. This phase of the problem was taken up more vigorously than any other and it is indeed gratifying to the bureau that the explosions from coal dust in 1914 have decreased 96 per cent. from the previous year."

Prevention of Lead Poisoning.

The following list of Instructions for the prevention of lead poisoning to employees has been found to be of great service by the Ohio State Board of Health in its recent investigation of Health-Hazards and Occupational Diseases in Ohio. (Report just published.)

"(1) All workers exposed to lead dusts, lead fumes, lead solutions and lead compounds are liable to poisoning. These poisons get into the body through the nose while breathing, or through the mouth when chewing, or swallowing, or wetting the lips.

"(2) Do all you can to keep down dust. When sweeping or cleaning, always dampen with water, oil or wet sawdust. Where dust cannot be kept down, you must wear a respirator. This must be cleaned out at least once a day.

"(3) Eat breakfast before going to work. Drink milk at meals, and if possible once between meals. Do not eat meals in workroom. Leave work-room at meal times.

"(4) Keep dirty fingers out of your mouth, and off of your food, and whatever goes into your mouth. Wash hands, arms and face with warm water and soap before eating, going to the toilet, or quitting the workroom. Clean your lips and rinse out your mouth before eating or drinking.

"(5) A moustache, if worn, must be kept short. Do not wear a beard. Keep fingernails clean and cut short, also loose skin about the nails or hands.

"(6) Do not chew tobacco or gum while at work. Avoid the use of intoxicants in any form, as they promote lead poisoning.

"(7) Take a full bath with warm water and soap at least twice a week.

"(8) You must wear overalls and jumpers while at work. Wear a cap if exposed to dust or fumes. Do not wear your working clothes outside of the working place.

"(9) Keep your bowels moving if possible once a day. Report to your foreman if you notice (1) loss of appetite, (2) poor sleep, (3) indigestion, (4) continual constipation, (5) vomiting, (6) pains in stomach, (7) dizziness, (8) continual headache, or (9) weakness in arms, limbs or body."

Decrease of Quarry Accidents.

The number of quarry accidents in the United States in 1913 was 14 per cent. less than during 1912, while the number of men employed had decreased only 6 per cent., according to Technical Paper 92 of the Bureau of Mines, compiled by Albert H. Fay. This booklet classifies the men employed and the accidents by the kinds of quarries in which the men worked. According to this classification the limestone quarry work caused most accidents, namely, 93 during 1913 and 101 during 1912, these figures being in one case 4½ times and in the other 3½ times as high as those for cement rock quarries. Relatively, however, cement rock quarries have the highest death-roll, namely, 3.17 per mill in 1912 and 2.91 in 1913. During 1912 marble quarries ranked second with 2.63 per mill and trap rock third with 2.42, while in 1913 slate was second with 2.56 per mill and trap rock third with 1.93.

Safety Engineering, January, 1915.

Explosive Hazards in Manufacturing Plants.

A complete survey of the above subject is made in an article by J. C. Barden in the January number of *Safety Engineering*. The specific dangers of various explosives are pointed out and remedies suggested for the conditions.

Care must be exercised in storing large carboys of sulphuric, hydrochloric, nitrite and hydro-phuloric acids to avoid high temperatures, unsafe rests, striking, tight corking and slippery floors.

Special rules are given concerning the handling of dangerous gases or vapors, such as gasoline, benzine, alcohol, hydrogen etc., together with the weight of these gases compared to that of air and a discussion of the methods of ventilation.

The dangers of acetylene lighting systems require that the calcium carbide should be kept in watertight metal cans by itself outside the main buildings under lock and key and where it is not exposed to the weather. Specific rules should prohibit the charging of apparatus excepting during daylight hours, the deposit of residue in sewer pipes or near inflammable material and testing the generator or piping with the flame.

Some dust substances from which explosions have been known to occur, oil coal, lamp black, tow, wood dust, cork, sulphur, malt, flour, celluloid, sugar and dextrin, not to mention the dangerous explosives frequently found in manufacturing plants, such as celluloid, chlorates, collodium, dynamite, gun cotton, gun powder, nitrogen chloride, nitro-glycerine, picrates and picric acids which are explosive from heat, shock or friction. Proper ventilating system should remove the explosive dust, while the explosives mentioned in the last list should be stored in separate locked buildings away from heat and sharp or hard instruments or tools.

The article is written from the standpoint of the insurance inspector and continues with a discussion of these various hazards as applied to each of our common industries.

Grain Dust Explosions.

The Millers' Committee of Buffalo has just reported on a form of industrial accident which is said to have been responsible during recent years for the death of seventy-eight men and the injury of one hundred and nineteen. This is the explosion of grain dust in mills and elevators.

Such dust is said to be even more inflammable than coal dust which has long been recognized as responsible for explosions, and it is capable of developing higher pressures on explosion. Not only open lights are the immediate cause of the explosion, but sparks from motors and from friction of belts and grinding machines.

It is recommended that above all else dust should be prevented from escaping into the air, a precaution which would incidentally do away with much of the occupational disease in this industry.

The Survey, January 23, 1915.

CURRENT PUBLIC HEALTH LITERATURE.

AMERICAN.

Boston Medical and Surgical Journal, Boston.

CLXXII, No. 6. February 11.

Venereal Diseases and Prostitution. W. D. Bierbach. P. 201.

Journal American Medical Association, Chicago.

LXIV, No. 6. February 6.

Occurrence of Return Cases of Scarlet Fever and Diphtheria. Experience of the Chicago Department of Health Since the Introduction of a System of Classified Quarantine. G. B. Young. P. 487.

Journal Medical Research, Boston.

XXXI, No. 3. January.

A Study of Streptococci Isolated from Certain Presumably Milk-borne Epidemics of Tonsilitis Occurring in Massachusetts in 1913-1914. T. Smith and J. H. Brown. P. 455.

Public Health Reports, Washington.

XXX, No. 5. January 29.

Smallpox, Not Plague, at Chattanooga, Tenn. P. 309.

Difficulties in Obtaining Ages—Popular Ignorance and Carelessness Regarding One's Birthday and Age. P. 310.

The Purity and Strength of Household Remedies—Variations in Purity and Strength of Widely Used Drugs and Preparations a Possible Source of Danger to the Patient. P. 311.

XXX, No. 6. February 5.

Public Health Administration in Washington. P. 371.

XXX, No. 7. February 12.

"Tuberclecide" Not Investigated by the United States Public Health Service. P. 469.

Infectious Jaundice. P. 469.

The Limitations to Self-Medication. Uses and Abuses of Proprietary Preparations and Household Remedies. P. 470.

Impounded Waters—A Study of Such Waters on the Coosa River in Shelby, Chilton, Talladega, and Coosa Counties, Ala., to Determine the Extent to which They Affect the Production of Anophelines, and of the Particular Conditions which Increase or Decrease their Propagation. P. 473.

XXX, No. 8. February 19.

The Federal Antinarcotic Law. P. 533.

Age Distribution of Typhoid Fever. P. 534.

Malaria Control — Drainage as an Antimalarial Measure. P. 536.

Rat Proofing the Public Docks of New Orleans. P. 545.

FOREIGN.

Journal State Medicine, London.

XXIII, No. 2. February

Housing Conditions and Their Relation to the Spread of Tuberculosis. A. M. Williamson. P. 33.

Journal Royal Sanitary Institute.

XXXV, No. 12. January.

Means and Methods of Promoting the Knowledge of Infant Hygiene. H. R. Kenwood. P. 529.

Munchener Medizinische Wochenschrift, Munich.

LXI, No. 50. December 15.

The Water Supply at Antwerp after the Water Works were Destroyed. Furth. P. 2396.

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SCIENCE AND THE PUBLIC HEALTH.

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An address delivered before the students of the Drexel Institute, Philadelphia, November 25, 1914.

HAD I been at liberty to choose the subject on which I am to address you today, I should have somewhat modified its title. The subject, "Science and the Public Health,'' is cold and uninteresting. It calls to mind unlimited statistics and figures. There is little in the subject that appeals to the imagination. And yet viewed historically there is probably no more romantic page in history than the emergence of the world from the ignorance, bigotry and superstition of the earlier centuries to the modern conception of public health. It will be my attempt in the time that has been allotted to me to try and picture to you the influences that have been at work during this long period of time to change our attitude towards the value of human life. I hope it will be evident, from the data which I will present to you, that the remarkable change which has been noted is due primarily to the influence which science has exerted in studying the causes which underlie disease; in determining the effects of these causes and in inventing and creating the mechanism for their removal.

I have said that earlier centuries, with respect to the problem of public health, were times of ignorance, of superstition and even of violent bigotry and hatred. Let me cite you an example of what I mean. The fourteenth century will ever be memorable in the annals of public health. It was in this century, from the period of 1348 to 1351, that the so-called "Black Death,'' or as we know it, the bubonic plague, ravaged nearly all sections of the then civilized world. Transplanted from China it spread to Europe. The story has it that this event was heralded by earthquakes and other natural phenomena. Before its fatal work finally ceased it had killed nearly twenty-five millions of human beings, approximately one fourth of the world's population.

It was but natural that those who were afflicted should have endeavored to ascertain the cause of their suffering. It is interesting, one might almost say astonishing in these days, to know that with all the other possible reasons that might have been ascribed to explain the origin of this dread calamity, rumor spread from city to city, and eventually from country to country, that the disease was caused by the poisoning of wells and rivers by Jews. Nor did the tale end here. Gossip carried from mouth to mouth and from town to town soon elaborated the story. Not only were rivers and wells poisoned, but even the air was included. It was definitely stated as a known fact that individuals in Spain were engaged in manufacturing the poison which was used and that messengers had been dispatched far and wide with boxes containing the poison. Even the ingredients were stated. In this concoction there were employed the flesh of basilisks, spiders, frogs and lizards, mixed with the hearts of Christians and the dough of consecrated wafers. The results were obvious and certain. In 1348, in a certain town of Southern France where the false report seems to have emanated, twelve Jews were cast into the flames. From France the rumor spread to Catalonia and Aragon. One country followed the example of another. On Lake Geneva, throughout Switzerland, in the cities of Cologne and Strasburg, congregations were burned at the stake and tortured. Even though Pope Clement VII took up the cause of these unfortunate people and showed that the plague occurred even in sections and cities where no Jews resided, his efforts were without avail. It is estimated that ten thousand Jews were killed in Poland alone. It is more than probable that in all, over twenty-five thousand people gave up their lives as a result of this ignorance and superstition.

Possibly no greater contrast can be shown to this state of affairs than the year 1914 in the United States of America. To one and all of you conversant with the current news there must be known the recent outbreak of an epidemic of bubonic plague in the city of New Orleans. Immediately the public health authorities of the United States, with the full knowledge of its origin, took steps to hold it in check. Since the Government took hold of the situation in New Orleans, there has been practically no spread of the epidemic. Instead of butchering human beings by the thousands, the officials have exterminated thousands of rats known to them as the carriers of the infection. It is a far cry from the fourteenth to the twentieth centuries. It is a far cry from the methods of the benighted past to the application of scientific knowledge, as evidenced in our modern methods of dealing with epidemics of the kind described.

I hoped, in presenting this subject to you, to be able to do so without calling on statistics to aid me. If, however, we are to appreciate what has been accomplished through scientific knowledge and to obtain an accurate picture of the marvelous changes that have taken place in five hundred years, we cannot do so without having before us the mental picture which is given by mortality figures.

The following will illustrate what I mean: Roscher has pointed out that, even as late as 1761, 50 per cent. of the English population died before reaching the age of twenty. The enormous gain of today is not appreciated until one realizes that at present one half of the people of England live until the fifty-fourth year has been reached. It will occasion no surprise to learn that in Prussia, during the decade 1751–60, only 312 out of every 1,000 children survived to the age of ten. In other words, two thirds of the entire population failed to reach an age of social usefulness, and perished while still a burden to parents and a cost to society. In the admirable studies which Westergaarde has made, he has shown that in Sweden, during the decade 1751–60, 13 per cent. of all deaths were due to smallpox—a proportion far in excess of that caused by the "white plague" of today. England, France, Germany and the minor European countries all testify to the gradually increasing expectation of life of their inhabitants. The tables computed for Netherlands show a most remarkable degree of progress. In the period 1811–25, one half of the males died before reaching the age of twenty-five. During the decade 1860–69, forty years represented a probable life-time. The table by Van Pesch for 1890–99 shows that the fifty-sixth year is now passed before one half of the males perish, although one-fourth only were left at that age in the period 1816–27.

In addition to the facts brought out by the figures given above, you will be interested to know that in England and Wales, in the years 1841–50, out of 1,000 infants less than one year of age, 153 died. In the year 1906, the mortality was still 132 per thousand. Since the year 1910 in New York City and in other cities in the United States, the death-rate for infants has fallen below 100 per thousand. It remained for the scientific research of the last decade of the nineteenth century to show that, if infants are given pure milk and fresh air, infant mortality can be materially reduced.

A similar lowering of mortality rates are observable at other age groups, from all of which we may draw the general conclusion that, in the last hundred years, there has been a marked improvement in population mortality and that, as a result, human beings are living longer today than they did one hundred years ago.

Certain interesting facts, however, are brought out, when these mortality figures are studied not merely according to age groups, but according to the causes. It has been found, for example, that the reduction of mortality has been most pronounced in the diseases which are distinctly infectious in nature. By these I refer to diseases such as smallpox, the plague, typhus fever, scarlet fever, typhoid fever, etc. In fact, one or two of these diseases such as typhus fever and smallpox, are gradually becoming extinct in the United States. On the other hand, it appears that deaths from diseases such as cancer, diabetes, cerebral hemorrhage and apoplexy, organic diseases of the heart, diseases of the arteries, cirrhosis of the liver and Bright's disease have not decreased proportionately to deaths from so-called infectious diseases, and in a few instances have actually increased. The vital statistics for the so-called registration states of the Census Bureau show an increase of deaths from cancer in the year 1910, as against the year 1900, of 30 $^6/_{10}$ per cent. Similarly there has been an increase in deaths from diabetes of 60 per cent. and of diseases of the arteries of 396 $^3/_{10}$ per cent. Cirrhosis of the liver and Bright's disease should be added to this category with increases of 14 $^3/_{10}$ per cent. and 18 $^1/_{10}$ per cent., respectively. The rate for the seven diseases combined, mentioned above, is 33 $^4/_5$ per cent. higher for 1910 than for 1900.

Let us see whether we can explain the true reasons for these important and interesting changes in mortality. Studying the infectious diseases by themselves we find a most amazing picture of the application of pure science in combating these particular evils. It sounds crass and sordid to say that the reduction in the number of deaths from contagious diseases and the prevention of these diseases is due to the discovery of a small and insignificant germ. What a vista this discovery opens to the scientific student! What hours of research, what days of investigation, what fruitless and useless tests and attempts were made before the final clue was found. The tribute due to medical science is one that must be unhesitatingly and ungrudgingly given. Without the unselfish labors of the medical fraternity, without their brilliant and keen analysis, without their willingness to labor unceasingly in the pursuit of a theory, it is likely that we should still be, so far as public health is concerned, in the dark ages.

It would seem to me that the appeal which can be made through the imagination of students in an institution such as this, by work of the character described, must be exceedingly great. The education which is being given to you here is to ground you in the fundamentals of the various sciences which you are studying, so that eventually you may be competent to inaugurate research and investigation on your own responsibility. The example which has been set to you by men such as Metchnikoff, Koch, Virchow, Klebs-Loeffler, Ehrlich, Pasteur and Wassermann should act as an incentive to follow in the footsteps of these giants in the field of medical discovery, particularly if it be remembered that in a number of classic instances theory preceded results. I need not tell to students of the sciences such as you are, the fascinating story of Mendeleéff and the atomic theory and how subsequent discovery of new elements proved the correctness of his theory. Similarly, some of the most brilliant discoveries in the field of bacteriology have been the result of preconceived theories.

And yet, great as has been the contribution of medicine to the improvement of the health of the people, other sciences have played their important and valuable part. I have referred above to the science of statistics.

And yet this science would have been of little value had not the Greek perfected his geometry; had not the Arab invented algebra; had not Napier constructed his logarithms.

After medicine the one science which probably has played the greatest part in improving health conditions is the science of chemistry. Much as praise is to be given to medicine for its results, it is questionable whether any of these results would have been brought about without the coöperation of her two handmaidens, chemistry and physics. Had not Priestley discovered oxygen in the year 1774 and had not these discoveries been followed up by the brilliant experiment of Lavosier on air, it is doubtful whether medical research would have reached the high point of development which it occupies today. Without the microscope we would not have discovered the bacillus. The discovery of ether and chloroform were in the domain of chemical science. Can you conceive of a more beautiful, one might say poetic, thought than that of Kekule's conception of the benzene ring, which revolutionized the field of organic chemistry. One need but recall the many derivatives of the coal-tar group of which a number have valuable medicinal properties as narcotics and febrifuges.

Physiological chemistry also has added its quota to the fund of information which has been of benefit to medicine. The studies which have been made regarding the nature of secretions, the chemical changes which take place in the human body, the effect of drugs on the human organism and in particular the comparative studies which have been made on the lower animals have all had their valuable influence in bringing medical knowledge to the point where the subsequent discovery of the nature and action of bacteria has become possible. Without these preliminary chemical studies, as I have said above, it is doubtful whether the bacteriological researches which have culminated so successfully would have borne fruit.

In other fields of public health work the science of chemistry has been equally valuable. Generally speaking, one may include under public health work of the municipality, state or federal government the following subdivisions: The care of the water supply, the care of the food supply, the care of the milk supply; the removal of dirt, ashes and garbage and the cleaning of streets; the disposal of sewage; proper housing, and the control of contagious diseases. The science of chemistry has been availed of in all of these subdivisions. The production of an adequate and a potable water supply is not only a question of the removal of pathogenic bacteria, it involves a study of the general composition of water itself, which can be accomplished only by a careful chemical examination of this important element. The recent agitation for pure food has largely been due to investigation and researches which have been made primarily by the Department of Agriculture, Division of Chemistry, in the composition of food stuffs and the detection of impurities been introduced into them. It is only through a thorough knowledge of the constituency of food stuffs that we are able to determine their value from the standpoint of nutrition. Here the science of chemistry in the past few decades has been of inestimable value.

Nor has engineering science been found wanting in this great campaign for the improvement of health. Without its help we might still be groping for the solution of the problem how to reduce illness. It is not possible to conceive of a proper water supply today without utilizing the services of the sanitary engineer. The problems of filtration, purification and transportation of water over long distances has necessitated the use of engineering knowledge of the highest degree. Our food supply would still be limited in quantity and frequently decayed were it not for the accomplishments of engineers in building refrigerators and cold-storage cars. The architect as well as the engineer has designed sanitary barns and dairies for the proper housing of cows. Today we have sanitary milk bottles and bottle-washing machines. The removal of dirt from our streets today is no longer the problem of the individual. The old adage that the streets of Jerusalem were kept clean by reason of the fact that each individual swept the section of the street in front of his own door no longer applies. Street cleaning today is a community problem. As such, it can be done more effectively. Such a development would not have been possible had not the engineer given the means for adequate water supply and had he not devised properly paved streets which permit the highest efficiency in cleaning with a maximum expenditure of labor and time. One cannot conceive a comprehensive system for removal of sewage that does not involve the brains of the mechanic and of the engineer. Our problem of efficient housing for workingmen, the construction of sanitary and well-lighted tenements in big cities, has required the joint efforts of the architect and the engineer. To the extent to which all of these agencies coöperate in the improvement of health conditions, the sciences referred to have contributed their measure of assistance.

Until now we have given consideration primarily to the subject of public health as a phase of public work. The lowering of the death-rate from contagious diseases has largely been the result of municipal, state or federal activity. As stated above, statistics show a material lowering in the mortality from contagious diseases. This reduction in the death-rate can in a large part be attributed to the active steps which have been taken by health officers and health departments everywhere in enforcing laws and ordinances.

On the other hand there are certain diseases in which the death-rate apparently had not been reduced. Such a condition seems extraordinary in view of the marked changes that have taken place in social, economic and industrial conditions in the last hundred years. It might have anticipated that in these diseases, such as arterio-sclerosis, heart disease, etc., a reduction in mortality would have taken place correspondingly to the reduction in the so-called infectious diseases.

If the statistics are correct, it leads up to the other important consideration in connection with the general subject of human life, namely, the question of individual health as contrasted with public health. In the domain of the latter much has been accomplished. In the domain of individual or personal health there is yet much to be done. We are on the edge of a novel and interesting development along lines of personal health. Human beings are beginning to appreciate and to realize that they have responsibilities to themselves and to the community to maintain physical efficiency at the highest. The state and the community may do much to guard the individual from extraneous dangers to his life. The individual himself must look after and be on guard against the dangers that come from within.

It is conceded by many authorities that the illnesses of later life are to some extent the results of illnesses contracted in childhood. For these the individual is only in part responsible, since under efficient government his exposure to such diseases would be slight. To a large part, however, the degenerative diseases of later life, as they are known, are the result of the individual's carelessness and negligence, and in too many instances they are due to his indifference and fault. We are just beginning to appreciate the results of over-indulgence. Year by year we are learning more of the value of foods and are realizing that in too many instances we are catering to and pampering our physical appetites. It does not seem unsafe to say that many of us eat too much, that we are overloading our digestive organs and are paying the penalty in later life. Over-indulgence in alcohol and tobacco is common. Mental inertia and physical laziness tempt us to the comforts of the cozy chair rather than to the brisk walk and other much needed exercise. It is within the memory of many of us older ones when daily bathing was considered a luxury and not a necessity. Edison has claimed that the normal individual needs from two to four hours of sleep. If this be the case the larger part of our population is obtaining a surfeit of this commodity. Work, which was decreed for all of us, is frequently done under strain and stress. Studies which have been made confirm the belief that physical and mental fatigue have a decided influence on physiological processes.

To sum up, it appears that if we are to develop a nation of physically sound men and women, more is necessary then action on the part of the public authorities. It is evident that if health campaigns are to be effective, each individual must do his personal share towards keeping himself in the acme of physical condition. We must learn that we as individuals are responsible to our fellowmen and to our progeny. There is a moral obligation as well as a physical one not too succumb to the temptation of over-eating, over-drinking, absence of exercise, and overwork. The next decade will be one in which the campaign of personal hygiene, as distinguished from public hygiene, will be fought. It will be asked of men and women that they assume the responsibility of keeping themselves in the best possible physical condition, so that the wasting diseases of middle and later life be minimized and so that we may build up a race in which our descendants shall be known as those who survive because they are physically fit to survive.

Nor is there any reason why this should not be possible. In the domain of personal hygiene, science has been equally as lavish as in the field of public hygiene. Men are able to live better than was possible in the days of our fathers. This is true not only for the man of means but for the worker whose entire asset is the labor of his hands. The statutes of many states protect and safeguard workmen against industrial accidents. The wise and conscientious employer today realizes that the welfare of his employees means better protection and greater efficiency. To bring about ideal conditions, this wise and humane employer has called on the scientist so that his employees may work under ideal conditions. He has used the sanatarian to improve the ventilation and the lighting of his plant. He has called on the architect to draft plans, so that work shops may give the maximum of light and air. He has summoned the engineer and the inventor to construct machinery so that toil and strain shall be reduced; labor-saving machinery has taken the place of the human being for tasks that were back-breaking and nerve-racking. Hours of labor have been reduced so that men and women may enjoy a maximum of leisure and rest and recreation.

The list of inventions, discoveries and improvements which science has brought about in the last few decades for the conservation of human life is limitless. Think of the changes that have taken place since your forefathers lived in this city of brotherly love; think of the changes in transportation. How different from the old drafty stove-heated coaches are the Pullman trains of today. Think of the difference in our homes from the early days when they were lighted with tallow candles, and today when electricity has been utilized to devise a lighting system which shall place the least strain upon the eyes. Even the deaf are beginning to hear with special electrical appliances invented for this purpose. Through the aid of science, dental surgery today enables every individual at a minimum of pain and discomfort to keep his teeth in the best possible condition. Recent research has shown the vital part good teeth play in the problem of good health. The telephone, telegraph and wireless message have enabled us to transact business at a modicum of expenditure of time and energy. Nor do these benefits accrue to the resident of the city only. The farmer as well has profited. Labor-saving devices and improved machinery are removing from him the toil and the strain which heretofore have been a part of the tilling of the soil. For those who become ill, modern surgery and modern hospital treatment are hailed as the possible deliverers from death. We are gradually learning through introductions of proper safeguards to avoid diseases that are due to dust in our streets or in our factories. The vacuum cleaner is becoming an essential part of the family outfit. Elevators take us to our apartments in our homes where we find fireless cookers, gas stoves, washing machines and even electric irons and electric toasters. Artificial ice has taken the place of possibly contaminated ice from our rivers and streams. Bi-focal glasses enable us to correct impaired vision and obviate the necessity of the old-fashioned horn spectacles. Who today wears the old red flannels or the hobnailed shoes of a few decades ago? Our homes, our clothing, our food, in fact everything that affects our happiness and well being have been improved through the instrumentality of science, to keep us in the best possible physical condition.

The motto of the New York Department of Public Health reads as follows: "Public health is purchasable. Within natural limitations a community can determine its own death-rate." The lesson which this adage teaches is obvious. It recognizes the fact that human beings differ from the lower animals in the ability to reason. It postulates the optimistic conception that reason, which is simply a synonym for science, may be applied to the betterment of human health conditions. In due course we may be able to live out our allotted span of life. Whether this shall be threescore years and ten, or even longer, as some contend, is a problem for the future. As reasoning beings, gifted with the ability to control our own actions and appetites, there is open for us the opportunity through sane methods of living, through the careful regulations of our daily habits and through the opportunities which are given us on all sides to live wholesomely, the opportunity is given to us, I repeat, to live to a ripe, happy and contented old age.

THE CONTROL OF VENEREAL DISEASES BY HEALTH DEPARTMENTS.

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Read before the meeting of the Massachusetts Association of Boards of Health, Boston, January 28, 1915.

HEALTH departments are created and financed to safeguard the public health. Each state and municipal health department has its own peculiar problem in deciding how it can most efficiently spend its appropriation.

The character of the work of health departments has entirely changed in the past twenty-five years by reason of laboratory discoveries, and their application to public health measures. Probably the next generation will see even more striking changes.

Notable achievements have been accomplished in health measures directed against diphtheria, tuberculosis, typhoid, yellow fever, malaria, hookworm, and other serious diseases.

But two of the most common and dangerous of communicable diseases —syphilis and gonorrhœa—have been practically left untouched by health departments. There is, however, one striking exception, namely, the Health Department of the City of New York. Its sane and scientific work in venereal diseases merits the commendation of all medical men. This department was the pioneer in establishing free complement fixation tests for syphilis and gonorrhœa. The results of their laboratory work, and their methods of reporting cases, have demonstrated that there is a practical method which any state or city can apply to the control of venereal diseases.

Personally, after many years' experience in laboratories, in hospitals, in the autopsy room, and in private practice, I have no hesitation in stating that the ravages of syphilis and gonorrhœa are far greater than those caused by diphtheria, scarlet fever and typhoid combined. Yet not so many years ago, these diseases occupied much of the attention of health authorities.

It seems reasonable and proper to believe that the time has come when every state and municipal health department should, yearly, spend some part of its appropriation in attempting the control of these diseases.

The Worcester District Medical Society's Committee on Venereal Diseases, of which the writer is a member, recently sent out to its members a pamphlet, a part of which is quoted below:

> Syphilis infects about 5 to 10 per cent. of the adult population.
>
> Syphilis causes about 20 per cent. of all insanity.

Syphilis causes about 10 per cent. of epilepsy.
Syphilis causes many of the idiotic and feeble-minded children.
Syphilis causes most cases of locomotor ataxia, many brain lesions and many spinal-cord diseases.
Syphilis causes most early apoplexies and many late ones.
Syphilis causes very many cardio-renal diseases.
Syphilis is to be looked for in many "indefinite ailments."
Syphilis causes much infant mortality and many abortions.
It is the one great hereditary disease.
Gonorrhœa infects a very large percentage of the adult population.
Gonorrhœa causes more than 10 per cent. of blindness.
Gonorrhœa causes a very large percentage of the pelvic operations upon women.
Gonorrhœa causes about one half of all cases of sterility.
Gonorrhœa causes much joint disease and other septic conditions.
Practically all prostitutes are infected with one or both of these diseases.

We have made a start to attack this problem in Worcester. Late in 1913 the City Hospital established a Wassermann department in its laboratory. We have sheep, rabbits, and guinea pigs, the blood of each of which is used in the Wassermann test as done in this laboratory. We added to the equipment a high-powered centrifuge, a "still" for distilled water, water baths, special incubators, and a dark field microscope for the quick detection of spirochaete in primary lesions, mucous patches, etc. During the past year over 1,500 Wassermann tests for syphilis were made—not many in number, but highly interesting and instructive. This work has, I believe, proved of great value to the hospital. We have done a small number of complement fixation tests for gonorrhœa.

For the benefit of those about to establish a Wassermann laboratory in municipal work, I will add a word of caution. Remember that the complement fixation test is a difficult one, with many pitfalls. It requires special training and enthusiasm in serological work. It requires great accuracy. I cannot conceive anything worse in a community than would be the reports from an unreliable Wassermann laboratory.

The Worcester Health Department in January, 1915, voted to furnish, free, complement fixation tests for syphilis and gonorrhœa to all physicians of the city. The department has made arrangements to have this work done at the City Hospital laboratory.

Probably for the health departments of smaller cities undertaking Wassermann work, it would be advantageous to have the tests made at a local hospital having facilities for this work.

We expect that the City Hospital will in the near future establish a Department of Venereal Diseases, both for bed cases and out-patient cases, with probably an evening clinic once a week.

We have, also, by vote of the District Medical Society, appointed a number of physicians to give lectures before different clubs and associations on the subject of "Venereal Diseases." Thus we have made a beginning in Worcester. We don't expect miracles, but we look forward with hope that good will come from this beginning. Now, in a very imperfect way, I want to review with you some facts about the venereal problem, to show its magnitude and to impress upon you the great opportunity of public health departments to meet this situation.

I believe in preventive medicine, in a greater and greater control of diseases by the national, state and municipal departments of health. I believe that the great problems of present-day medicine of the future can probably be better solved by central authorities than by individual doctors. As I look into the future, it seems clear that a greater and greater percentage of medical men will devote their entire time to national, state and municipal departments of health and to the hospitals which will be under their control.

There are many problems in medicine, but I desire to call your attention to the venereal problem, the great black plague, the great untouched problem of present-day medicine, surrounded by ignorance, protected by false modesty and regarded as secret and shameful in character. Too long have we, day by day, gone about our work, simply picking up and caring for those either innocently or in guilt struck down, killed or wounded by those two malignant germs, the treponema pallida and the gonococcus. It is a question involving not only medicine, but morals. Its long neglect is a shame upon those three great forces in the community which, united, could and must solve this problem. I refer to our profession, the church and to educational institutions, and to medical men properly should the bulk of the work fall. We must be the leaders, for it will be no easy task. There will be a lively opposition. Good legislation cannot accomplish anything important, unless public opinion endorses it.

The general public is entirely ignorant of the magnitude and severity of venereal diseases. I believe even that the medical profession in general has not a clear idea of the amount of venereal disease existing in every community. It looks almost like a hopeless task, almost like the task of changing human nature, to attack this problem successfully. It is a problem which affects so many departments of life; much of it so vile that many will fear to have it disturbed, and bound up so inseparably with that ignoble pair, prostitution and alcohol. But great and difficult as this problem is, I believe that it can be to a large degree successfully handled, and that the chief factor in it must be public medicine, that is, the health departments.

STATISTICAL EVIDENCE SHOWING HOW WIDELY THE COMMUNITY IS INFECTED WITH VENEREAL DISEASES.

The more statistics you obtain the greater are you impressed with the seriousness of existing conditions and the more you are impressed with the apathy of both the medical profession and the laity. From the nature of the case it is difficult to get a true light on the statistical situation throughout any given community. But it can be approximated. Many statistics are wild, inaccurate, based on some man's guess. But the statistics which I present now I believe are accurate and may be taken as a guide in estimating the havoc of these diseases. I have said that statistics are hard to gather, and you have but to look at death returns to realize it. If you study them, alone, you will think that these diseases are rarities. If you read hospital statistics and institutional reports you will think that there is no occasion to worry. And why? Because a spade is not called a spade, and any name except the true one goes down. If death returns should be put under syphilis, as they certainly ought to be put, the deaths from paresis, locomotor ataxia, other cord diseases, many coarse brain lesions, a considerable percentage of all apoplexies and nearly all early apoplexies—that is under forty years of age—almost all cases of aneurysm, a very large number of heart diseases and nephritis caused by the arterial degeneration of syphilis (the relation of syphilis to heart disease is an extremely important one and greatly underestimated)—if this were done the tables would read far differently, and we should find that syphilis was easily within the first six great diseases that destroy human life.

And it is much the same with statistics of gonorrhœa. The tables do not show much, but it is there just the same. Deaths from almost all cases of suppurative salpingitis, many cases of abortion and peritonitis, due to an infected endometrium; many cases of unrecognized gonorrhœal rheumatism and endocarditis, and many cases of acute and chronic pyelonephritis should be classified under deaths caused by gonorrhœa. I have spoken only of the fatalities of these two diseases. Who knows the number of lives wholly or partially wrecked by these two germs, the treponema pallida and the gonococcus?

Now come some figures which you must all agree are accurate and convincing to show that there is need of an awakening of the public and the medical conscience.

First, the reports of the surgeon-generals of the army and navy. Probably there is no exaggeration here as they cannot be proud of it,—for our army and navy is, I believe, more infected with venereal diseases than any other army or navy in the world. In 1912, with an army strength of about 78,000 men, there were 2,224 cases of syphilis, 6,208 cases of gonorrhœa, and 2,207 cases of chancroid; about 10,699 cases of venereal diseases, and this despite four years of prophylactic treatment,—that is, compulsory reporting at once on returning from exposure. The previous years were much worse. Fifty per cent. of some colored regiments in the Philippines were infected with venereal diseases in one year. In 1912 there were more discharges for disability on account of venereal diseases than for any other one cause. In the navy, with about 41,000 men, including the marine corps, there were in 1911, 1,665 cases of syphilis, 5,658 of gonorrhœa, and 1,929 chancroid, a total of 9,252 cases of venereal diseases. In 1912 there were about 300 fewer cases.

This certainly is a serious state of affairs, when about 25 per cent. in the navy are infected.

Now come the statistics furnished by the insane hospitals. Most important, most impressive! All experts admit that the three great causes of insanity are syphilis, alcohol and heredity; and of the hereditary cases how many are in some way influenced by syphilis? For we know the deadly action of the treponema upon nerve tissue. Think of this when you call to mind the millions of insane throughout the entire world, and again I ask if it is not time for every nation to consider this question seriously.

During the year 1913, at the Boston Psychopathic Hospital, out of 1,671 admissions it was found that 246 had positive Wassermanns, *i. e.*, about 15 per cent. At the Danvers State Hospital for the insane, for the year ending September 30, 1913, all cases were tested for syphilis and 20 per cent. were found positive. Think of it—one in every five! What a burden to the state. What untold personal and family suffering. The reports of practically all the insane hospitals of the world run from 10 to 20 per cent. of syphilitics. That one piece of evidence ought to be enough to "wake up" the public and the medical profession and the lawmakers, yet it doesn't seem to be.

It has a direct bearing also on epilepsy, for at the State Hospital for Epileptics at Monson 47 consecutive admissions were recently tested and 10 per cent. were found syphilitic.

The Massachusetts Commission for the Blind state that of 301 cases of total blindness treated at three Boston hospitals the past year, 10 per cent. were due to syphilis and gonorrhœa. Applying this to the 4,000 odd blind people in Massachusetts we should find that over 400 persons in this state are totally blind from these two diseases. Neisser reported that there were 30,000 people blind in Germany on account of venereal diseases. There are 64,000 blind persons in the United States, and 10 per cent. of these are due to the gonococcus alone. Of all the blind children in the blind institutions of this country it is estimated that 25 to 30 per cent. are there on account of gonorrhœa. Fortunately these figures will be lower in the future on account of the prophylactic treatment of the eyes with nitrate of silver or argyrol immediately after the birth of the child.

Here is another bit of evidence from our state industrial schools. Ninety girls just entering prostitution were examined, and 21 we found to have syphilis, 31 to have gonorrhœa and 4 to have both diseases. That is, 62 per cent. were venereally infected. Of 100 prostitutes examined at the Charles

Street Jail, the Suffolk County House of Correction and the Woman's Reformatory, 11 had syphilis, 32 had gonorrhœa, and 27 had both. In 20 the presence or absence of these diseases was not determined. Of 80 women, 70, or 87½ per cent., had one or both of these diseases.

Even worse in its showing is a careful examination of 466 young women at the Bedford Woman's Reformatory of New York, where only 10 per cent. were free from disease, that is 90 per cent. were infected with either syphilis or gonorrhœa.

In a recent inquiry concerning 8,000 male patients over 18 years of age admitted to a Boston hospital for all sorts of medical and surgical cases 35 per cent. admitted had had gonorrhœa and 11 per cent. syphilis at some period of their lives.

It would be an easy matter to multiply these credible statistics tenfold, but these show clearly enough that there is truth in the statement that one half of the male population of civilized countries has had or now has gonorrhœa, and that probably more than one-tenth has had either acquired or congenital syphilis. Even if this were only one-fourth true, why do medical men and health authorities keep up this policy of "watchful waiting"?

It would be a waste of time to go into a historical account of syphilis and gonorrhœa, but I want to review with you in a brief way a few points.

More has been learned about syphilis in the last ten years than in all the centuries gone by, a wonderful renaissance, which began with the discovery of the real germ of this disease in 1905 by Schaudin in Germany. It is interesting to note that over 125 supposed discoveries of the germ of syphilis had been made before the real discovery came. In 1906 the discovery of the complement fixation blood test was announced by Wassermann, also a German, and a little later came Ehrlich's salvarsan, also "made in Germany." What a revelation these three have been. Not long after, at the Rockefeller Institute in New York, Noguchi announced his isolating and growing of the spirochæte, and then came animal inoculations and the Luetin test. Each of these discoveries is being used daily in attacking syphilis.

Today we can in most cases diagnose syphilis the moment the chancre appears, simply by expressing a bit of serum from it or a neighboring gland, then placing it on a slide and with the dark field apparatus seeing the spirochæte alive and wriggling under the microscope.

Unfortunately the Wassermann test is not practical until two or three or more weeks after the appearance of the initial lesion, and it is a cruel thing, almost criminal, to wait for the secondaries before beginning active, vigorous treatment with both salvarsan and mercury, for during the month or so that elapses before the secondaries appear the body is filled in every nook and corner with millions of spirochætes. Strike early and strike hard, for then is your best perhaps your only chance to really cure a case of syphilis, and by so doing you render that individual in the early stage practically unable to spread the disease, a measure of great public importance, in wild young men and prostitutes especially.

Use the Wassermann test not only for diagnosis, but also as a guide to treatment. You will be disappointed often enough, whether you use salvarsan or mercury, or both, at the Wassermann becoming positive after an interval of perhaps months of being negative. But this means that there are living spirochætes within the body, and not until the last spirochæte is dead have you truly cured your patient.

The present opinion of many of the best experts seems to be that only a small percentage of cases are ever really cured, for the spirochæte attacks every organ of the body, the brain, cord and nerves, more often than is suspected the heart and arteries. You will hear more and more in the future of syphilis of the lungs. So that in almost any ill-defined chronic case you may be repaid if you make a blood test.

Today we know the germs that cause syphilis and gonorrhœa. We have practically accurate laboratory methods of diagnosis. These laboratory methods should be extended to every physician in this Commonwealth, to aid him in diagnosis and treatment. Too often, now, are they entirely overlooked or imperfectly treated.

RECOMMENDATIONS.

To accomplish something in attacking the venereal problem I have in my own mind a few definite ideas.

I should like to see appointed a committee from this Association, a committee on the control of venereal diseases.

I should like to see this committee, among other things, consider especially:

(1) The advisability of making syphilis and gonorrhœa reportable diseases.

(2) The advisability of securing the passage of a law making these records private records. As I understand the state law now, all board of health records are public records, and anybody can inspect them, which of course could not be allowed in the case of syphilis and gonorrhœa.

(3) The advisability of the committee conferring with the health commissioner of this state to secure the establishment of a state Wassermann laboratory, a laboratory to which the workers in the municipal laboratories could go to improve their knowledge, and to establish a uniform technique throughout the state.

(4) The advisability of securing the passage of a law compelling public institutions to treat acute venereal disease.

Now as a final word, I believe that the venereal problem is peculiarly one for public health departments. For the sake of humanity, for the honor of public sanitation, let us take up this work.

THE REPORTING AND CONTROL OF VENEREAL DISEASES.

Louis Chargin, M. D.
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Read before the Massachusetts Association of Boards of Health, Boston, January 28, 1915.

As a menace to the individual, the state and the race, the venereal diseases stand preëminent. The dire results following in their wake both physical and social are too well known to require mention here. Contemplate for a moment, if you will, the actual infection, the complications, the sequelæ, and last but not least the effect upon the future of civilization, and the wonder is that drastic measures have not been taken ere this.

Since the earliest times some efforts at control were attempted. "Prostitution and all its attended diseases . . . was abolished *in toto.* Isolation beyond the camp was practised. In the camp of Moses, the syphilitic could not destroy . . . humanity by propagation of his fearful disease." In 1126 England enacted a law threatening brothel keepers with a fine if they harbored diseased women and ordering regular visitations by physicians. Brothel regulations existed in Avignon in 1347, and similar laws were promulgated in Zurich in 1413. Regulations of the Council of Lucerne, directed against prostitution in 1469 and 1572, show that measures of control were put in force. But it was not until the advent of syphilis in its epidemic form that more generalized measures of public control were undertaken.

The modern prevention of syphilis dates back to the middle of the eighteenth century with attempts at registration in Rome and Naples, and soon thereafter, just before the French Revolution, the system of registration and regular examination of prostitutes was introduced into France. It is upon this system that most of continental Europe bases its control to the present time. The exceptions are Denmark and Norway where, since 1874 and 1876 respectively, there has existed a system of compulsory notification in one form or another to this day.

The system of control that has been in vogue throughout the continent of Europe is the so-called reglementation, which includes registration, segregation and examination of prostitutes. The foundation of this system is registration, without which it is impossible. If registration fails so must the system, so that in order to make it effective it is necessary to have a system of registration which is near perfect. That such attempts have failed will become manifest when it is stated, on the authority of Flexner, that of an estimated total of 50,000 to 60,000 prostitutes in Paris but 6,000 are registered; of 20,000 to 30,000 in Berlin, only 3,300 are registered. This holds true in other cities where registration is obligatory. Furthermore, the clandestine prostitute is one of the most fertile sources of the spread of the infection, and control over her by registration is well nigh impossible. Curiously enough, too, a fruitful source of infection, namely the male element, is entirely ignored. There are other reasons for the unsatisfactory working of this system. It must, therefore, be conceded that reglementation *per se* has proved a failure. That it has a certain value in that it neutralizes some foci of infection is true, but on the whole it is insufficient.

The New York City Board of Health has for many years laid down the principle that all infectious and preventable diseases and everything pertaining to their diagnosis and supervision properly fall within the scope of its activities. This attitude finds its justification in the following considerations. Is it not essential for the control of any infectious disease that its correct diagnosis be made rapidly and that the means for so doing be made readily accessible to all members of a community? Take the diseases under consideration. The greater the number of existing syphilitics and gonorrhoics diagnosed and the more rapidly they are placed under treatment the more certain will our control of the diseases be.

Many sanitary officers agree that no distinction should be drawn between the venereal and other infectious diseases. If so, the fundamental principle which guides us in the one should guide us in the other. True, an antipathy toward them did exist and this has occasioned reluctance on the part of sanitary authorities to deal with them. The fact is they are infectious diseases and should be dealt with as such. Now the basis that underlies effective control of infectious diseases is complete information regarding them, and this is possible only by means of a system of notification and registration. The eventual and ideal object in view is through supervision, effective prophylaxis and treatment. These remarks apply especially to the diseases under consideration. So too a campaign of education, a diffusion of knowledge of its dangers is a matter of utmost importance. It is along these lines that the activities of the Health Department of the city of New York have taken root and are slowly, and we believe, effectively progressing. The initial step towards administrative control of the venereal diseases was taken by the board of health, April 4, 1911, when it was resolved that the "protection of the public health requires the early adoption of means for the sanitary control of venereal diseases." This was soon followed, December 8, 1911, by a further communication from the then general medical officer, Dr. Herman Biggs, detailing more fully the necessity for such action, with the result that the board of health with the sanction of the Advisory Committee, on February 20, 1912, adopted a set of resolutions, which abridged are as follows:

First: After May 20, 1912, officials in charge of public institutions will be required to promptly report name, age, etc., of every patient under observation suffering from syphilis in every stage, chancroid or gonorrhœal infection of every kind, including gonorrhœal arthritis.

Second: That all physicians be requested merely to give similar information regarding cases under their care in private practice, leaving out name and address if they so desired.

Third: Such reports to be considered confidential.

Fourth: Facilities for bacteriological and serological diagnosis be provided.

Fifth: That the diagnostic facilities be extended only when complete data required for registration be furnished.

The sense of these resolutions, with some modifications based on experience, will be embodied in the section of the Sanitary Code of 1915 relating to venereal diseases, which will read:

Section 88: Duty of Superintendents of Hospitals and Dispensaries and of physicians, to report cases of venereal diseases.

It shall be the duty of the manager, superintendent or person in charge, of any correctional institution and of every public and private hospital, dispensary, clinic, asylum, or charitable institution in the city of New York, to promptly report to the Department of Health the name or initials, together with the sex, age, marital state and address of every occupant or inmate thereof or person treated therein affected with syphilis or gonorrhœa; and it shall also be the duty of every physician in the said city to promptly make a similar report to the Department of Health relative to any person found by such physician to be affected with syphilis or gonorrhœa. All reports made in accordance with the provision of this section, and all records of clinical or laboratory examinations indicating the presence of syphilis or gonorrhœa, shall be regarded as confidential, and shall not be open to inspection by the public or by any person other than the official custodian of such reports or records in the Department of Health, the commissioner of health, and such other persons as may be authorized by law to inspect such reports or records, nor shall the custodian of any such reports or records, the said commissioner of health, or any such other person divulge any part of any such report or record so as to disclose the identity of the person to whom it relates.

For the most part this section is self explanatory. Since we are for the present not doing supervisory work, it was deemed best to leave to the discretion of the individual physician the question of reporting cases by name. In justice to all no discrimination is made between institution, clinic or private cases; such was made in the original resolution of 1912. All reports are kept under lock and key and are inaccessible except as stated in the section. It will be noted that chanchroid was entirely omitted. This is owing to the mild character of the infection and to the fact that mediate infection is practically negligible. So, too, the stages of syphilis and the varieties of gonorrhœal affections are not specified since they are inclusive in the terms syphilis and gonorrhœa.

That opposition, varied, numerous and from different sources, was encountered one may readily surmise. But as in the case with tuberculosis, it is gradually but certainly disappearing so that the department has every reason to feel encouraged.

The history of the sanitary supervision of tuberculosis as developed in New York City offers a close parallel to the venereal problem, and the development of the latter is taking its course along similar lines. The diagnostic facilities afforded physicians at the inception of the tuberculosis work has furnished the most important medium of inducing them to report their cases and it is precisely the same in our present undertaking; it is the laboratory through which most of the cases are reported.

As above stated, the department maintains that all facilities for the diagnosis of infectious preventable diseases properly fall within its province and, conforming thereto, it has provided every available means for the ready diagnosis of these diseases.

The Health Department laboratories perform the Wassermann Reaction and complement Fixation Test for gonorrhœa, examine smears for treponema and gonococci and make cultural examinations of urinary sediments and urethral discharges. These tests are made free of any cost. They are made for physicians and medical institutions only, to whom the findings are reported. In order to facilitate the transferring of specimens the diagnostie outfits are distributed to some six hundred stations in drug stores and hospitals scattered throughout the city, from which stations they are daily collected and conveyed to the department laboratory. The extent to which physicians and hospitals have availed themselves of the opportunity may be gauged from the figures of 1914 which show a total number of 57,724 specimens being handled.

	1914	*Positive*	*1913*	*Positive*
Wassermann Tests........	42,415	13,870	18,750	7,602
Complement Fixation Tests	9,441	2,099	3,526	690
Smears..................	5,868	1,381	2,105	632

The total number of venereal disease cases reported for the year 1914 is: Syphilis, 21,155; gonorrhœa, 9,526; chancroid, 517.

There have also been established three diagnostic clinics, two in Manhattan and one in Brooklyn, where patients may be sent by their physicians or institutions for the blood-letting operation, smears, etc. These clinics are well patronized, the total attendance for the year just ended being 19,297.

Principally as an educational factor an advisory clinic was established which acts as a sort of clearing house for venereal diseases. Here free advice is given regarding the nature of these diseases, the danger of improper treatment is pointed out, the necessity for strict adherence to their physician's orders, the danger of consulting quacks, the importance of abstention, while diseased, etc.

Educational pamphlets, describing the diseases in simple language, and cards of instruction are issued. Under no circumstances is treatment of any character given. Cases that require treatment and cannot afford the services of a private physician are referred to any of a number of accredited clinics in the various parts of the city. These clinics, in order to be placed upon the approved list, must comply with the requirements of the Genito-Urinary Section of the Associated Out-Patient Clinics of the City of New York. Patients that can afford private treatment are directed, through these clinics, to one or another of the specialists attending the approved clinics; 1,427 patients attended our advisory clinic during the past year.

An analysis of the chart shows that by far the males predominate. Presumably the female element, perhaps because of fear of publicity, reluctantly attend. It is interesting to note that more married than single individuals consulted us. This may be accounted for by the fact that, being older, they are more staid and consequently are more concerned about their ailments. Of 1,180 cases tabulated, 560 were either suspected or actual luetics, 360 suspected or actual gonorrhoics, 77 suffered from sex neuroses of one type or another, and 115 were other than sex diseases.

Part of our educational campaign consists in combating quackery. This is one of the most difficult problems with which we have to contend. Their victims are many, usually foreigners (with a heavy admixture of apparently intelligent citizens) whom they find easy dupes. What could not be said regarding the methods of this unscrupulous class! Two possible means of attack present themselves. One is to legislate them out of existence. There exists a law which empowers the regents to revoke the license of practitioners found guilty of fraud, etc. But how difficult it is to prove fraud! The board of aldermen have recently passed a bill making persons whose assertions represent untruths, etc., liable to a fine. An attempt is being made at the present time to test it out. The second means of attack is the diverting from these quacks of prospective victims. This we do by a four-line advertisement which we run parallel with their own in some of the New York English and foreign press. It reads:

> FREE ADVICE regarding venereal diseases can be obtained at the Department of Health' 149 Centre Street, Room 207, from 9 a. m. to 12 m. daily. Sundays and holidays excepted. Consultation strictly confidential.

The value of this advertisement may be judged from the figures of December, 1914, when of a total of 200 patients seen by the medical advisor, 72 reached us through the advertisement, and of these 72, 36 had consulted one or more quacks. Another means which we believe will prove very effective is the placing of "Venereal Disease" signs in suitable locations, such as toilets and bulletin boards of railroad stations, terminals, factories, saloons, department stores, etc. These signs read:

VENEREAL DISEASES
CONFIDENTIAL ADVICE
REGARDING
GONORRHŒA SYPHILIS
AND
SEX DISEASES
CAN BE OBTAINED FREE
AT ROOM 207
THE DEPARTMENT OF HEALTH
149 CENTRE STREET
9 A. M. to 12 M. DAILY
SUNDAY AND HOLIDAYS EXCEPTED
AVOID
ADVERTISING SPECIALISTS AND
PATENT MEDICINES

During the same December, 26 persons consulted us through these signs, though we have but a small number, about 150, distributed.

No system of control can be complete without ample hospital and dispensary facilities for the treatment of indigent and infectious cases. Although we must not lose sight of the fact that those with infectious lesions are properly hospital cases, the venereal diseases are essentially well adapted to dispensary treatment. This somewhat simplifies the problem.

While a number of our clinics are in every sense adequate, it is unfortunately true that the efficiency of the majority may well be questioned, in that they are not equipped for modern diagnosis and treatment. Under the instigation of the Genito-Urinary Section of the Associated Out-Patient Clinics, conditions are, however, improving and we look forward to a better state of affairs in the near future. Regarding hospital accommodation, it may be said that there are available at the present time some 300 beds in our city institutions exclusively for venereal diseases, and it must be admitted that, without greatly increased facilities—a matter insisted on by Doctor Biggs—we must of a necessity be hampered in our control of actively infectious cases. It is gratifying to report that sufficient funds have been allowed for the construction of an added pavilion to one of our municipal hospitals.

In this connection it may with truth be said that any outlay of funds now for the purpose of constructing additional wards is in reality an economy. For, with competent facilities, modern and early treatment, may we not with justice hope that syphilis will be robbed of its great terror—tertiarism? And with it may we not expect a saving in the great economic loss which it entails?

The purely educational propaganda forms an important feature in the plan of our campaign. The educational force must overcome the prejudice of centuries and will of a necessity be slow, but certain it is, as in the case with tuberculosis, publicity as a factor in combating the venereal diseases is becoming a recognized procedure. A comprehensive plan embraces the social, economic and medical aspects. It is a coalition of the forces which will finally conquer, but as health officers we are concerned only with the last named, working, however, in concert with all the other agencies.

This is probably the least developed of our forces but it is gradually increasing in strength and will certainly become a powerful, in fact, the powerful agent in our possession. Already the public is awakened to its importance and is making frequent requests for lectures on the subject. Similar requests come to us from other sources such as schools, clubs and other organizations.

As an instance may be cited a recent public meeting in Cooper Union at which a symposium on the subject of venereal diseases was held. This was attended by a mixed audience of more than 1,500 adults and was followed by free-for-all discussion from every angle. A remark made by one of the speakers of the evening is significant. He stated that it was his belief that a public meeting, such as was then taking place, was hardly conceivable but a few years ago.

Our aim should be to reach all classes of society.

To the younger element there should be imparted a graded course of instruction regarding sex function and hygiene. The more mature should be instructed in the meaning of sex diseases and, in the words of Morrow, "To all we must speak plainly, but sanely, clearly but cleanly, scientifically but simply."

The writer wishes to express his thanks to Doctor John S. Billings, director, Bureau of Infectious Diseases, for many suggestions, and to Dr. Archibald McNeil for some of the statistics quoted.

Discussion.

Dr. J. W. Voss of Beverly: Discussion of this subject seems to be apropos as nothing can be of more interest to sanitarians than the control of venereal diseases. Gonorrhœa, so far as my observation extends, causes more unhappiness in the human family than all the rest of diseases put together. Syphilis is extremely prevalent and easily acquired. It was only a few days ago that I heard one authority state that 50 per cent. of syphilis was communicated outside of venery. Syphilis is just as loathsome as any leper who never did anybody any harm and can be segregated on the barren island of Penikese, simply on account of our biblical Sunday-school teaching that a leper is an unclean person. In deference to prudery, and through a long period of introspection, we have allowed a dense cloud of ignorance to befog this whole subject because we believe the people's private troubles are to be the subject of garrulous conversation. We had the same objection in 1907 when tuberculosis was required to be reportable. Who would think of going back to those former conditions? These excellent papers show what can be done and show that New York City and New York State are far ahead of us in the control of communicable diseases. Nothing at all is being done in this state. They have no standing as diseases under the law, are discriminated against in our hospitals and nothing is done in this state to prevent their spread. It frequently happens when a dangerous focus of venereal diseases is brought to the attention of health authorities they refuse to act, claiming, forsooth, they have no power to act, that they cannot spend their appropriation for this purpose, as the central health authority has not considered them diseases dangerous to the public health.

Dr. Palmer: Mr. President, I have been intensely interested in the two papers read today, and I don't think any measure of value can be put upon them as regards their importance. We had a committee of this society for a number of years which did some preliminary work along these lines. I think most physicians and a great many laymen recognize the importance and the danger of these venereal diseases, but while we recognize them so far we have been inactive in a public way in controlling them. A great deal can be done through the public officials, probably more can be done through the public officials than by any amount of social or educational work, but I think both are equally important. I think the public is far more willing to be taught than the physicians, as a class, are willing to teach them. That is my experience. If in other parts of the state there is the same interest that there is in my section, where for several years I have been called to speak before all sorts of societies on the venereal peril, I think it can easily be brought about in the near future that we can control these diseases better than they have been controlled.

The President: Dr. Palmer has alluded here to something that the Association has done in this line of work, and I want to say that some years ago a committee, of which Dr. Palmer was chairman I believe, was appointed by the Association, and some knowledge of the spread of these diseases and some of their dangers was brought to the attention of the Association in a pamphlet which the committee adopted.* For a great many years I was secretary of this Association, and I had demands for that pamphlet from all sections of the country. So that this Association was early in the field along this line of endeavor, and our blazing the trail was recognized by those demands that came from all over the United States to me when I was secretary for copies of that pamphlet. Those demands still continue, I believe, but the pamphlet is now furnished by one of the civic societies on Joy Street in this city, who have taken it up. The pamphlet was of such value in their estimation that they have taken it up as a matter of duty and have undertaken the cost of printing and circulating it. I thought I would give that explanation for the benefit of those who were not members some years ago when this work was done.

Mr. Charles W. Birtwell: May I simply correct the chairman, in order that you may have the exact title of the society he referred to? Those circulars, called Sex Hygiene Circulars, Nos. 1, 2 and 3, are now distributed for the Committee on Sex Hygiene, of which Dr. Palmer is still chairman, by the Massachusetts Society for Sex Education, of which Dr. Henry P. Walcott is president and Dr. Charles W. Eliot, vice-president. The office of the society is at 6 Hancock Avenue, that little path to the west of the State House lawn. As its secretary I happen to have in my hand in acknowledgment of copies of Circular No. 3, a statement from the head of a large business organization: "We find these circulars of vast help to our girls." Circular No. 1 bears the title: For Young Men; No. 2, Information for Persons Having Venereal Disease; No. 3, Information for Young Women. We have them in four languages beside English: Italian, Greek, Polish and Portuguese, and are contemplating printing them in other languages.

Dr. Whitehouse: In regard to the propaganda of public education on sex lines, I have had the personal pleasure of being called upon to examine young men contemplating marriage I think half a dozen times since the middle of last winter, and on further questioning these requests have been a direct result of having seen a certain play, the title of which was "Damaged Goods." The play seems to have made a most profound impression on the young people.

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* See further information in following remarks by Mr. Birtwell.

EVENING CLINICS FOR SYPHILIS AND GONORRHŒA.

Michael M. Davis, Jr., Ph. D.,
Director of the Boston Dispensary.

Read before the Massachusetts Association of Boards of Health, Boston, January 23, 1915.

THE subject that I am to speak upon is rather the side of treatment, than the side of diagnosis, which has been chiefly dealt with by the other speakers. One may approach these diseases from three standpoints: The standpoint of the clinic, from which syphilis and gonorrhœa are diseases requiring treatment; the standpoint of the public health officer, to whom they are dangerous infectious diseases, requiring various preventive and remedial measures; and the standpoint of the general public, or the social standpoint, from which each of these diseases presents all kinds of public problems, relating to a wide field, from the liquor traffic and prostitution to police administration, family life, and many other things not excluding politics.

The practical consideration which faces one who is concerned with institutional work is the problem of not only providing facilities for diagnosis but of affording adequate facilities for treatment. In approaching these diseases from the standpoint of the public health officer we are faced with the veil of secrecy, or false modesty as one of the previous speakers today has called it, and that is surely the chief reason why we have difficulty —it seems to me the most fundamental difficulty in this whole matter— of applying the public health point of view, which is the only point of view that can solve such a problem as this. We find it impossible to deal with syphilis and gonorrhœa in the way that ordinary infectious diseases, much less dangerous, can be dealt with. Furthermore, syphilis and gonorrhœa have other relationships. They are difficult to cure, requiring a long time. Because of that, the treatment is rather expensive, and the diseases from the treatment standpoint have been proved by practical experience to be good business, which causes them to be rather more involved in certain kinds of irregular medical practice, than most disorders which mortals are heir to.

To answer the question why we need evening clinics, as it seems to me we do, I should like to begin by propounding this inquiry: What treatment facilities do we *now* have for syphilis and gonorrhœa? There are four:

1. Private medical practice;

2. Hospitals and out-patient clinics, the latter the more important, for, as others have said, the bulk of treatment of syphilis and gonorrhœa is ambulatory treatment;

3. Irregular medical practice—advertising experts, quacks, correspondence institutes; and finally

4. Self-treatment, *i. e.*, treatment of a patient by drugs which he buys himself on the recommendation of friends or from the advertisements which he sees or which are given to him through certain agencies.

Now the question is, whether or not the *good pair* of this list of four treatment agencies are adequate to meet the needs of the public.

We will all agree that quack practice and self-treatment are undesirable. I do not know that any one has any data showing the relative number of cases cared for by private medical practice, clinics and hospitals, quack practice and self-treatment. I have been unable to find any data as to their relative amount in any community. Undoubtedly, however, the amount of quack practice and the amount of self-treatment is large. There has been some testimony on that today. I can only mention one item that came to my notice a few days ago in reading a paper by Dr. John H. Cunningham, Jr., of Boston, published a couple of years ago in the *Boston Medical and Surgical Journal*, in which he referred to nine agencies advertising the treatment of venereal diseases in Boston, and said that on the best authority that he had been able to secure, one of these agencies was making an income of $50,000 and another $35,000 a year. Whether or not the figures are correct, and he did not seem to place any great reliance on their exact accuracy, the amount of such practice is undoubtedly considerable. The mere existence of such agencies seems clear proof that private practice and clinics together are not filling the needs of the public for the treatment of syphilis and gonorrhœa.

Can private practice become adequate to meet the need, or must we depend upon clinics? If we could stop all treatment by irregular practitioners and all treatment by drugs not prescribed by physicians, would private practice take up the slack? I don't suppose one can answer that question except *a priori*, but if private practice is active and reasonably aggressive in a proper way and desires to enlarge itself, and if irregular and undesirable agencies of treatment nevertheless persist, it seems a question whether private practice would be able to take up the slack, even if we pressed more hardly than we now do upon the undesirable agencies. Undoubtedly in recent years there has been a growth in the number of clinics treating syphilis and gonorrhœa, and in the number of patients treated by such clinics. With the present trend in medicine we may probably anticipate a further development of clinical work for the treatment of many diseases, and perhaps especially for the treatment of syphilis and gonorrhœa. For one thing, in the offices of private doctors, or at least in offices which are open on fees available to the mass of the working people, the diagnostic facilities are, so far as I learn from the testimony of medical friends, very generally inadequate and below modern standards. How many such offices would have cystoscopes, facilities for Wassermann tests, or dark-field microscopes? These are not frequent in private offices, for the cost usually puts them out of the question. A clinic in an institution which has any pretensions to a decent standing can be expected and can be compelled, ought to be compelled, to provide such diagnostic facilities; and if that is true, and if we are going to press, as we should, more and more hardly upon the undesirable facilities of treatment, we must open up more and more facilities for the clinical treatment of syphilis and gonorrhœa.

I think our point of view has undergone a tremendous change even in the last few years. Not long ago I was talking with a physician whose memory goes back long before I was born, and he told me his father could remember the time, in Boston, when two of the oldest and largest institutions with out-patient clinics, the Boston Dispensary and the Boston City Hospital, forbade the treatment of syphilis and gonorrhœa on the ground that the persons coming with those diseases were unworthy objects of charity, having acquired disease as a result of their own sensual indulgence. The contrast between that point of view and the present point of view of the public health officer, who sees the necessity of treating people for the protection of the community, if for no other reason, is a very wide one. And yet only two days ago a man who is connected with a prominent organization in Boston asked me whether the Boston Dispensary treated venereal disease and whether it was a proper thing for an organization, supported by charitable gifts, to treat people who were as wicked as he supposed all the sufferers from syphilis and gonorrhœa must necessarily be. He asked me that question in all seriousness. By the smile on some of your faces I see his point of view does not agree with yours. Your smile breaks forth because you are applying the public health point of view.

Now to come to the subject from which, perhaps, I appear to have wandered,—evening clinics. I have been trying to indicate the importance of out-patient clinics, as one of the factors, and an important factor, in the treatment of syphilis and gonorrhœa. Evening clinics to my mind are important, and indeed essential, because if we are to have clinical treatment it must be efficient treatment. Can clinical treatment be efficient? Can we measure the efficiency of treatment of syphilis and gonorrhœa? It is difficult to measure that efficiency in terms of the proportion of cured cases, because it is often impossible to state with scientific assurance that a case of syphilis or gonorrhœa has been cured.

On the other hand, we can measure the negative side with considerable ease and accuracy, and reach the conclusion that much clinical treatment, as it exists today, is extremely inefficient and that we are wasting a large part of our money and time. Efficiency tests can be made quite simply by a simple process of *counting*, after asking ourselves this question: What proportion of 100 or of 1,000 patients coming with gonorrhœa, we will say, to an out-patient clinic, pay only one or two visits to the clinic?

A patient with acute gonorrhœa, who pays only one or two visits, is not going away cured, or even sufficiently relieved to make the clinic feel that it has done a satisfactory job. I think all medical men will agree with that. Yet in two clinics in which such tests were made, it was found that 30 to 40 per cent. of patients taken at random, men coming with acute gonorrhœa, ceased treatment after not more than two visits, and from 50 to 60 per cent. after less than six visits. Tests have been made quite independently in the male genito-urinary clinics at the Boston Dispensary and Lakeside Hospital at Cleveland, the percentages running closely together along the levels that I have mentioned. If that is true, and I am inclined to think that most clinics which test themselves in this way (all clinics should) will be surprised at the percentages they find. We must ask ourselves: Why is this so? What are the reasons for this inefficiency?

There are, at least, four main reasons: First, and perhaps the most common reason for inefficient work in an out-patient clinic for syphilis or gonorrhœa, is too many patients per doctor; second is lack of adequate equipment for diagnosis and treatment; third, lack of any follow-up system which brings patients back for treatment, and, fourth, the expense to the patient of leaving work to come to the clinic for treatment, most of the patients being working people. The two largest factors in inefficiency of treatment are, I think, the first and the fourth; *i. e.*, too many patients per doctor, or otherwise put, too small medical staffs giving too little time; and the cost to the patient of leaving work to come for treatment, particularly with diseases that require such frequent and long-continued treatments as syphilis and gonorrhœa. It is this fourth factor which, to my mind, necessitates holding clinics in the evening, when working people can come without loss of wages.

We might just for a moment turn to the other side and ask ourselves what the conditions of *efficiency* are. Something has been said about the standard of equipment as outlined by the Association of Out-patient Clinics of New York. I happen to have been quite closely in touch with those recommendations of that association, and, as Dr. Chargin knows, they relate primarily to equipment, *i. e.*, equipment of clinics for proper diagnostic work. But the lack of adequate medical service and the lack of any follow-up system and social service, are just as important factors in efficiency of treatment as the equipment of the clinic. They all ought to go together.

But the factor which I want to emphasize at this moment is the cost to working people of giving their time, which usually means at least two hours and as a rule more nearly a half day, to go to a clinic to get treatment. With that in mind the Boston Dispensary, some months ago, established evening clinics for syphilis and gonorrhœa. We were led to that step by these considerations, and by a further consideration very much forced upon our attention in the neighborhood in which the Boston Dispensary is located, namely the fact that while all the clinics in the local medical institutions are open only in the daytime, all the quacks work nights! Last March, shortly after we opened our evening genito-urinary clinic, which is practically a gonorrhœa clinic for men, I was handed a small card on Shawmut Avenue, not far from the Boston Dispensary, by a man evidently in the employ of one of the irregular practitioners in that district, advertising a "clinic" and mentioning of course the evening hours. I had the pleasure of sending it to a well-known surgeon in Boston who was helping us to open our evening clinic, congratulating him on being able to compete successfully with that kind of practice!

I wish to say just a word, purely in the way of illustrating some of the points concerning evening clinics, about the evening clinics for syphilis and gonorrhœa at the Boston Dispensary. We began an evening clinic for gonorrhœa among men in March, 1914. It has been running now ten months, three nights a week, the medical service being salaried, the fee charged patients being fifty cents a visit, although patients who can pay nothing and who cannot come in the daytime are not refused. Medicines are furnished at prices slightly above cost, that is at the same rates that we charge in the morning clinic, though patients, again, will be given their medicines free if they cannot pay for them. We have treated thus far (with clinics that now average nearly fifty a night), 476 patients, who have paid 5,371 visits, an average of about eleven and one-half visits per patient. A syphilis clinic on similar lines was established less than six months ago, one night a week, and though somewhat hampered with by the lack of salvarsan during its opening months, has been running thus far rather successfully with the same plan of a salaried medical staff and the same fees.

We have found out some interesting things from these evening clinics on this small-fee basis. In the first place, they have been self-supporting. They have paid all their running expenses, not counting overhead charges, but including all the running expenses, that is, the salaries of the physicians, nurses and clerks, the supplies used, the medicines, and a charge for lighting and heating of the parts of the building used. These clinics have drawn largely a class of working men, many of whom will come to a morning clinic when they are frightened about themselves, as in the beginning of a case of syphilis or in the case of gonorrhœa, when they are uncomfortable, but as soon as the more acute symptoms are relieved these men find it impossible to leave work once a week, much less two or three times a week, for treatment, without losing a great deal of wages or even their jobs. Many men who were attending our morning clinics at the time we opened the evening clinics begged to be transferred to the evening service, preferring to come in the evening two or three times a week and pay fifty cents a night, rather than come in the morning and pay nothing. It was cheaper for them, and I am sure better for the community.

You may ask the question: Why open evening clinics and charge a fee for admission so that you keep away the people who cannot pay anything? I am perfectly aware of the need of an evening clinic without a fifty-cent fee, but in starting an evening service I have been desirous to see it on a basis of efficiency. This seemed to me to require a salaried medical staff, and, furthermore, that we should reach a class of people who could perhaps afford to pay the fees at private offices for a few visits but who could not afford to pay the total cost of a complete course of treatment running over the long period that syphilis and gonorrhœa require. There is a class, and a large class, between those persons who can pay fees for adequate medical treatment in private offices and those who can pay practically no fees for treatment, and this middle class today is probably the most neglected group in the community. I am also well convinced that it would be possible to start a clinic on a fifty-cent fee basis and broaden it later in the direction of a clinic with a ten-cent fee or no fee, whereas it would be much more difficult to start on a nominal fee basis and then push the fee up. Whether or not the two classes of patients can be combined in one clinic in the evening I question. That is a matter to be solved in the future.

Let me before closing speak of one thing that is probably in the minds of you all. What about the relationship of such clinics to private medical practice? The evening clinic in New York City, as I happened to hear recently from Dr. Goldwater at his recent visit to Boston, has been strongly opposed by sections, and I imagine rather influential sections, of the medical practitioners in New York City, and so strongly opposed that many attempts to open evening clinics, either under the auspices of the Board of Health or of private institutions, have thus far been blocked. There are a few evening venereal clinics open in New York, though a physician recently said to me of one of them that its medical standard was low. It is unfortunate that opposition has crystallized in New York against evening clinics. Fortunately in Boston, and I hope elsewhere in Massachusetts from what Dr. Baker said about the possibility of opening an evening clinic in Worcester, there is at present no aggressive opposition to them here. We must, however, bear in mind that just because the treatment of syphilis and gonorrhœa is in the financial sense profitable from a practitioner's point of view, we are likely to find an antagonism to the establishment of any large number of evening clinics. It seems to me that we can only meet that opposition squarely and frankly. Doubtless there will be definite opposition in the future, if we have not faced it already, between the point of view of the practitioner who sees an immediate personal interest, and the point of view of the public health officer who sees the public interest. I cannot believe that in the long run the point of view of the medical profession, even as represented by the practising end of it, and the point of view of the community in health matters, as represented by the public health official, can run counter to one another. In the long run surely the point of view of the community, the needs of the community, must prevail.

In summary, it seems to me that the time has gone by when we can fail to apply the public health point of view to such urgent problems as syphilis and gonorrhœa present. The veil of false modesty that cloaks these diseases and the discussion of their problems must be pierced. We must face frankly the large amount of inadequate treatment and irregular practice of these diseases today, and must make the worthy kinds of treatment adequate and efficient. We must make them adequate by having enough of them. Since private practice is not adequate we must supplement it by clinics, and we must make those clinics efficient by giving them the proper equipment, sufficient follow-up systems, enough medical staffs (salaried if necessary) and above all by holding them at hours and under conditions which render them really accessible to the people who need them—both the people who can pay nothing and the people who can pay something and who would rather meet their own expenses, pay what they can, than be "objects of charity." The development of clinics for the treatment or prophylaxis of syphilis and gonorrhœa should not be regarded as a function of charity but as a matter of public health.

Discussion.

Dr. Voss. I would like to ask the speaker if there is any place in Massachusetts where any patient afflicted with syphilis—charity patient—can get free treatment. I have understood that Tewksbury is the only place where a patient is entitled to it, and then they only give one injection.

Mr. Davis: We give salvarsan free at the Boston Dispensary under these conditions: We charge for the ordinary injection $3.50. This is enough above the cost to give a surplus from those that can pay to meet the expense of giving a reasonable number of free treatments. Our rule has been for the last two years and a half, since we have been giving salvarsan, to refuse no patient who needs it. We have come out just about even during that period. That system was worked out at the Boston Dispensary quite carefully by Dr. Abner Post, and seems to us to be successful.

Dr. Nichols: In reference to the State Infirmary at Tewksbury, it was just suggested that one treatment, one injection, was given there. As a matter of fact, they all receive three treatments, and during the last three years 757 cases have been treated and 1,944 treatments have been given.

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A PRESSING PROBLEM.

Wanted: A Cure for Typhoid Bacillus Carriers.

A splendid bit of detective work conducted by Dr. M. L. Ogan, chief of the Epidemiologic Division of the Department of Health of New York City, has just disclosed the fact that an outbreak embracing twenty-five cases of typhoid fever in one of the hospitals in that city two months ago was due to infection from the kitchen at the hands of the well-known cook, "Typhoid Mary."

This carrier, originally discovered by Soper in 1907, has been associated with typhoid fever wherever she worked. For three years she was kept in the Health Department's isolation hospital, but was finally released on her promise not again to hire out as a cook and to use all precautions to prevent the occurrence of further infections.

Since the discovery of the prevalence of carriers and the important rôle they play in the transmission of infectious diseases, epidemiologists and sanitarians throughout the world have realized that they were facing one of the most important problems yet encountered and one of the most difficult.

The magnitude of the problem is apparent when we consider that even in a healthy city like New York, where nearly 3,000 cases of typhoid fever occur each year, this means the addition of over one hundred typhoid carriers annually. Allowing each carrier only twenty years of life, certainly a conservative estimate, it follows that there must now be over two thousand typhoid carriers at large in New York City. Until recently the city was also menaced by the carriers, over one hundred in number, present among the 200,000 persons handling its milk supply. This danger has, however, been removed by the compulsory pasteurization of all milk now sold in the city.

The fact that "Typhoid Mary" resumed work as a cook in the city, whose health authorities had exacted the promise from her to give up this occupation, shows how ineffective are the available methods of surveillance in the absence of the police systems prevailing in Germany and other European countries. It indicates that steps should at once be taken to provide for the establishment of some system of registration, bacteriological examination, and certification of persons engaged as cooks and kitchen help in public institutions, hotels, restaurants, etc. This, together with insistence on personal cleanliness, are about all that appear feasible at the present time. It has been suggested that careful inquiry be made concerning a typhoid fever history of every cook one is about to hire. We leave it to our readers to imagine how much reliance might be placed on any statements made under such circumstances.

It is clear that administrative efforts to control the spread of infections from typhoid bacillus carriers will be only partially successful so long as no reliable cure for the condition has been developed and to this end all efforts should now be directed. We earnestly commend the problem to our readers with the hope that it will soon be successfully overcome.

PROFESSOR SELSKAR M. GUNN,
Secretary, American Public Health Association.

My dear Professor Gunn: You, as secretary of the American Public Health Association, have had the goodness to communicate to me the resolution adopted at the Jacksonville meeting early in December last, which extends to me its regret at my withdrawal from active duties as president of the Superior Board of Health of Mexico, considers the responsible work attached to that position of the Mexican Republic and sends me all kinds of good wishes for my happiness and welfare. Also the recognition, so kindly expressed, of my humble efforts in the work of the Association and the Mexican Board of Health by electing me to honorary membership in the Association.

The appreciable manner in which the Association has acknowledged my services by conferring upon me such a high distinction and honor by electing me an honorary member has moved me profoundly, for I never thought my modest efforts in the grand work the Association has begun and continued on such a great scale, for the benefit and interest not only of the four nations in which it is formed, but also in all the inhabitants of the Western Hemisphere, and yet more for all humanity, would be rewarded by such distinction and for which I owe my lasting gratitude.

Mr. Secretary, through you I send my thanks and expressions of gratitude to the members of the Association for the high distinction that it has bestowed upon me and which I shall prize and honor throughout my life.

Wishing you all, health, happiness and prosperity, I am

Yours very truly,
E. LICEAGA.

THE CURSE OF NARCOTISM IN AMERICA—A REVEILLE

Jeannette Marks,
South Hadley, Massachusetts.

(Author of "Leviathan," A Story of the American Drug Evil.)

Read before the General Sessions, American Public Health Association, Jacksonville, Fla., November 30-December 4, 1914.

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IT has been my opportunity to talk to many audiences about the evil of habit-forming drugs. The guests came to hear what was said in the spirit of those who listen to a lecture on a far country—a country infinitely remote geographically and equally remote in its problems. It became my duty to make it clear that the country they had come to hear about was our own country, our own state, our own town, our own church, our own doctor's office—indeed our own hearthstone.

But for the first time it is my privilege to talk with those to whom I need not explain how close this drug problem is—to talk with those who know far more in many ways than it will ever be possible for me to know.

Yet there is one way in which I stand an equal here among you all: In my longing to do what I can to help. Nobody can know better than I do that I am a mere bugler sounding a reveille, a soldier in the ranks where I have served now for some four years or more.

It may be that there is a second reason why what I have to say may prove useful: I am a woman. Was it not good old Chaucer who said in the *Tale of Melibœus* some six hundred years ago, "What is better than jasper?" "Gold." "What is better than gold?" "A good woman." "What is better than a good woman?" "No thing." But I think that any good woman in answer to that question "What is better than a good woman?" would reply, "A good man." Nevertheless, every woman is aware that in her nature, in her consciousness of the needs of the home, in her answer to the demands of life, she holds a gift for humanity that no man, however good, can give. Certainly it is true that both life and the work of the world are based upon the heart of a woman.

Because I want to help, because I have spent almost five years studying this problem, because I have seen this hydra-headed drug-curse drag its horrible length across the hearth of a home, and know what it can mean to a woman to fight battles for those she loves, to go down into hell for another, therefore I have courage to speak to you.

Did you know that if we were to take all the colleges, including all schools of medicine, engineering, and universities both for men and for women and should multiply their present student bodies by five, and then all the alumni, both men and women, and multiply them by five, that even then we would fall short by a considerable fraction of one per cent. of the number of drug addicts in this country today?

Then do you know whether you have any drug victims in your family? Among your patients? In your church? In your community?

Did you know that there is practically no old American family of Civil War reputation which has not had its addicts?

Did you know that it was called "the army disease" because of its prevalence?

Did you know that with the war which now hangs over us, the drug evil will spring into a giantism of even more terrible growth than the present?

There were, at first 2,000,000 contestants in the Battle of the Aisne?

Did you know that there are something like 4,000,000 victims of opium and cocaine in this country today?

Then what loss does the curse of narcotism represent in our country? What is conservation going to do about this?

Did you know that there is no village, however small, in the United States today where you cannot get all you want of the camphorated tincture of opium in the form of paregoric or in various other forms in patent medicines?

Doesn't the druggist sell patent medicines? Don't these medicines depend wholly on habit-forming drugs and alcohol for their so-called "effect?"

Do you want to know what are some of the proprietary medicines my Investigator has found being sold in Springfield and elsewhere under the wing of the Massachusetts Drug Law? Maybe the druggist will say that this was "old stock." The important part is the law-breaking "old stock" is everywhere on sale.

(1) *M. F.*, 7 grains of opium per fluid ounce. (The law allows $2\frac{1}{2}$ gr. of opium.)

(2) *M. H.*, 6 grains of morphia sulphate, 16% alcohol. (The law allows $\frac{1}{3}$ gr. morphia.)

(3) *P.*, $1^{1}/_{9}$ gr. heroin, 17% alcohol, etc. (The law allows $\frac{1}{4}$ gr. heroin.)

(4) *H.*, heroin $1^{1}/_{10}$ gr., paregoric, 20 drops, alcohol 10%, etc. (The law allows $\frac{1}{4}$ gr. heroin.)

(5) *Dr. K's. New Remedy*, 7 grains of codeine, etc. (The law allows 1 gr. heroin.)

(6) *A. W. P. and T.*, morphine acetate 3.8 grains, chloroform, 17 minims. (The law allows $\frac{1}{3}$ grain of morphine.)

(7) *B's. Consumption Cure*, 6 gr. opium per fluid ounce. (The law allows $2\frac{1}{2}$ gr.)

(8) *W. P. and T.*, (manufactured by Scaife, in Springfield, Massachusetts) contains 1 gr. heroin. (The law allows $\frac{1}{4}$ gr.)

(9) *G's. S. of T.*, $1\frac{1}{4}$ gr. heroin, etc. (The law allows $\frac{1}{4}$ gr. heroin.)

(10) *W's. P. S.*, $\frac{1}{2}$ gr. morphine. (The law allows $\frac{1}{3}$ gr. morphine.)

(11) *Bs'. W. P. and T.* (manufactured in Springfield, Massachusetts), 3 gr. of opium. (The law allows $2\frac{1}{2}$ gr.)

(12) *M's. Balsam*, 6 gr. opium. (The law allows $2\frac{1}{2}$ gr.)

(13) *Terebene*, morphine diacetyl, $3^1/_{16}$ gr. (The law allows $\frac{1}{3}$ gr.)

(14) *A. Headache Powders*, codeine, $3^1/_{17}$ gr. (The law allows 1 gr.)

(15) *P's. Cure*, $2^1/_{16}$ gr. heroin. (The law allows $\frac{1}{4}$ gr. of heroin.)

(16) *W. P. and C.*, morphine diacetyl, $1\frac{1}{3}$ gr. (The law allows $\frac{1}{3}$ gr.)

(17) *Dr. F's. Cough-Cold Cure*, morphine sulphate, $2\frac{1}{3}$ gr. (The law allows $\frac{1}{3}$ gr.)

(18) *C's. Comfort*, morphine sulphate, $1\frac{1}{2}$ gr. (The law allows $\frac{1}{3}$ gr.)

(19) *Dr. I's. Vegetable Pain Extractor*, alcohol, 95%; opium, $3\ ^7/_{25}$ gr. (The law allows $2\frac{1}{2}$ gr. opium.)*

Do you want more? Well, there are scores of them.

Do you want to know what a wind of words the Massachusetts Drug Laws are? Acts of 1906, 386, Amended by Acts of 1907, 259.

Section 6: "It shall be the duty of the state board of health to cause the prosecution of all persons violating the provisions of this act; but no prosecution shall be brought for the sale at retail or for the gift or exchange of any patent or proprietary medicine or food preparation containing any drug preparation the sale of which is prohibited or restricted as aforesaid, unless the said board has, prior to such sale, gift or exchange, *given public notice in such trade journals or newspapers as it may select that the gift, exchange or sale at retail of the said medicine or food preparation would be contrary to law*." (Italics mine.)

Acts of 1910, 271.

"THE SALE OF MORPHINE AND OTHER NARCOTIC DRUGS.

It shall be unlawful for any person to sell, furnish, give away or deliver any opium, morphine, heroin, codeine, or preparations thereof, or any salt or compound of the said substances, except upon the written prescription or order of a lawfully authorized practitioner of medicine, dentistry or veterinary medicine, which prescription shall bear the name of the person giving it. But the provisions of this section shall not apply to any manufacturer, wholesale or retail druggist, nor to sales made to hospitals, colleges, scientific or public institutions; or to physicians, dentists, or veterinary surgeons; *nor to the sale of cough remedies and other domestic and proprietary medicines or preparations: PROVIDED, that such preparations are sold in good faith as medicines, and not for the purpose of evading the provisions of this act; and PROVIDED, that such preparations do not contain more than two and one-half grains of opium, or one third of a grain of morphine,*

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* The author will provide any members of the A. P. H. A. on application with the titles in full of these proprietary medicines.

or one-fourth of a grain of heroin, or one grain of codeine or their salts in one fluid ounce." (Italics mine.)

Mr. Frank Chase, Secretary of the New England Watch and Ward Society, was behind the framing of these drug laws. He worked night and day at them. Mr. Chase knew, and he knows, what the ideal law would be. He is amply able to frame the very best laws a state or nation could have. In the Acts of 1914, Chapter 694, he has dragged the drug situation a little nearer the ideal, but the law still takes away habit-forming drugs with one hand only to give them back, full strength, in proprietary medicines with the other.

Then why hasn't Mr. Chase done more?

Did you know that the proprietary medicine interests in this country represent a little less that $300,000,000?

Samuel Hopkins Adams can tell you a good deal about the patent medicine interests in 1906 in his *Great American Fraud*, published by the American Medical Association.

Did you know that the United States spends annually about $100,000,000 on these ghoulish nostrums?

Did you know that practically two thirds of the revenue of every drug store comes from patent medicines?

That's why!

Do you want to listen to a few little pocket-nerve conversations with druggists interested in the sale of patent medicines taken down by my Investigator?

(a) At M's., in S., October 21, 1914.

Investigator (feigning depression): I'd like a tube of one-eighth grain morphia tablets.

Druggist: You can't have them; the law won't let me sell them, but there's a headache powder containing 140 grains of acetanilide to the ounce and two grains of opium.

Investigator: But if you can't sell me morphia how is it that you can sell me opium?

Druggist: Well, you see, opium compounded with other drugs in medicines is harmless—why, it wouldn't do you any more harm than a glass of milk!

(b) At L's., in Springfield, October 21, 1914.

Investigator (looking much exhausted): Can I get some morphia here?

Druggist: No, you can't.

Investigator: Well,—

Other Customer (who has just come in, interrupting Investigator): Like a bottle of "M's. H." please.

Druggist (taking it down and wrapping it up): Twenty-five cents.

Investigator (to druggist and surveying woman going out with "M's. H."): Is that a good medicine?

Druggist: None better.

Investigator: I'd like to see a bottle. *(She reads on label "6 grains of morphia sulphate per fluid ounce and 16% alcohol.")*

(c) Investigator Buying Cough Syrup For An Old Lady.

At M.'s Pharmacy, Springfield, October 21, 1914.

Investigator: Yes, she's old and she's had this cough a long time.

Druggist (sympathetically): Is it a dry cough?

Investigator: Yes, and persistent. She's tried all sorts of cough syrups such as "Cherry Pectoral." But today she asked me to find something new and *really* good.

Druggist (wisely): Does it bother her mostly at night?

Investigator: Yes, it bothers her at night and she can't sleep.

Druggist (distressed): Can't sleep. Has she a cold?

Investigator: No, it isn't a regular cold. It's only a cough.

Druggist: Well, here's just the thing, one of the best cough remedies ever sold: *S.-F.-T.* I know what this is.

Investigator (takes a bottle and reads) "Less than 1% alcohol." Hum, that's reassuring! *(Continues reading)* "Each fluid ounce contains about chloroform, 4 minims: Morph.Diacetyl Hydrochloride 3/16 grains." Yes, indeed, this must be a good thing!

Druggist: Well, it is. I recommend it for all obstinate cases. And I take it myself whether I have a cold or not. *(To man just entering store.)* Doc. here, prescribes it for all his patients. It's put up specially for my trade, and I've ordered six more cases of it.

(d) At J. D. S's., in Springfield, October 23, 1914.

Investigator: Can I get a cough syrup here?

Druggist: Sure. Here's the best thing we have. "Terebene," put up specially for us.

Investigator (takes bottle and reads): Chloroform, 4 mins. Morphine diacetyl hydrochloride, 3/16 grains. Yes, I can see it's good.

Druggist (proudly): *Very* good. Our best. Sell lots of it—27 bottles today. *(To clerk)* How much of this have we sold today?

Clerk (looks on record): Twenty-seven bottles.

(e) At T's., Springfield, October 23, 1914.

Investigator: Can I get a cough syrup here?

Sales Girl (who has been talking to an overdressed woman): Yes, "T's. S. of W. Pine and T."—our own make.

Investigator (reading label): "*Morphine sulphate,* ½ grain."

Sales Girl (*to over-dressed friend*): It's great, isn't it, Clara?

Clara: I should say so! I give it to all the children for everything, and I couldn't get along without it myself.

Sales Girl (*recommending "B's. Syrup of Codeine"*): Did you ever try this, Clara?

Clara: No.

Sales Girl: Well, you ought to. I take it all the time, and it's dandy. It's fine to take at night because it makes you sleep so well.

(f) AT R'S., SPRINGFIELD, OCTOBER 23, 1914.

Investigator: I'd like some laudanum, please.

Clerk: Can't sell it.

Investigator: Can't sell laudanum! Why?

Clerk: Well, I don't know as I know. But I think it's a poison a lot of people have taken by mistake and been killed by it.

Isn't this about the whole story? The mistake may be ignorance or any one of a dozen causes, but is it ever anything but a mistake?*

Is there no legitimate use for narcotics? Yes, assuredly: the last stages of tuberculosis, hopeless carcinoma, sudden and terrible accident, the battlefield.

But do you think that narcotics in patent medicines don't matter? Have you read Dr. Kebler's Farmer's Bulletin 393 and also his *Present Status of Habit-Forming Drugs in America?*

Do you know Dr. T. D. Crother's *Danger from the Indiscriminate Use of Morphia?* Hear what Dr. Crother says about druggists and patent medicine manufacturers.

"A third class who are active in promoting narcomanias are druggists and manufacturers of patent medicines. The former soon discover the magic of prescribing doses of morphia for pain, and later teach the use of the needle, the druggist profiting by the sale of the drug. Many druggists change inebriates to morphinomaniacs by counter-prescribing some of the forms of opium. Physicians may start these cases, then the druggist helps on the addiction, and continues to sell the drug as long as the habitué can pay for it. The patent medicine proprietors use large quantities of opium, morphin and cocaine in the pain killers and nerve remedies. In one of these widely advertised drugs $\frac{1}{8}$ of a grain of morphia was found in every teaspoonful. Many of the brain and nerve remedies contain cocaine in addition to some form of opium. The popularity of such compounds often depends largely on the narcotics they contain. After their use a few months the druggist substitutes for them similar compounds containing morphin. The patient is then a narcomaniac. Not infrequently the history of the case begins with the use of proprietary medicines. The effect of morphia is then realized, though the drug is unknown. The physician is called in and he discovers morphinism in the abstinent symptoms when the proprietary drug is stopped. After an ineffectual struggle, he continues the morphia in some other drug, and from this on the course down is rapid. The patient drifts from one physician to another, each discovering the addiction and unable to help it, allows the patient to drift into other hands. Sometimes the case begins with the druggist, who prepares a mixture of morphin concealed in some flavoring substance, which is used for a time, then the patient drifts away to a physician and finally becomes confirmed in the use of morphine."

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* Dr. Wiley in a letter to me, said, "I do not know of any greater threat to the people of this country than the drug habit of all kinds and the promiscuous and continued drugging of the community by patent medicines and nostrums of all descriptions."

These pamphlets will tell you what patent medicines do to us and why they do it.

So much for the average druggist.

Now what about the physician?

Is the family physician addicted to the use of drugs? Is he a victim?

Did you know that the physician far exceeds in number every other class of addicts?

Do you know that if he is an addict he will be the first to prescribe a narcotic? Have you read Doctor Terry's report on *Habit-Forming Drugs in Jacksonville for 1913?* In a letter to me Doctor Terry places the percentage of addicts owing their addiction to the physician even higher. "I would place the percentage owing their habit to practising physicians at about seventy-five, and this even may be too low. Towns say ninety per cent., but he, on the other hand, draws patients from the well-to-do classes, and I believe that the average of our findings would come pretty close to representing the true state of affairs."

Do you know that college girls, the protected, the privileged, as well as working girls, purchase codeine tablets every few weeks at reputable druggists? Two Sal-Codia Tablets are to be had for five cents by working girls. Each tablet contains $^1/_{16}$ of a grain of codeine.

Did you know that there are reputable family physicians who put tubes of morphia tablets into girls' hands for monthly use?

Does the nurse girl dope the baby? Aren't there plenty of men and women here to whom when they were little things opium was given in the form of paregoric, Mrs. Winslow's Soothing Syrup, etc.?

Did you know it is the mother, often, uneducated by the doctor, and misled by the druggist, who, in her ignorance, starts the children in their dope-taking career? If we can't make out why a young man or woman doesn't make good in life, won't the cradle cry, perhaps, tell all we need to know of the incompetent, the pervert, the failure?

Do we always know what kinds of medicine are being given the children in our homes? In our town? In our community?

Are our children being taught on the street the use of habit-forming drugs?

Did you know that the respectable, if hum-drum, words, "school teacher" have acquired a new significance? That they mean those who teach children going to and from school the use of narcotic drugs?

Is there any mother, aunt, cousin, sister, father or brother who wants the children taught the use of cocaine and opium on the street?

Did you know that opium and cocaine are being sold in practically all our prisons? If we don't know it, Katherine Bement Davis does.

Did you know that the criminals in our prisons have discovered a way to make their own hypodermic syringes?

Do you know some of the ways by which the prisoners and officials smuggle various forms of opium into our prisons? I do, and some of them are not fit to repeat.

Hear what Frank Chase, the secretary of the Watch and Ward Society says: "The drug itself has crept into our penal institutions—we don't know how, but it has. Many men there have used the same hypodermic syringe, and the users of the drug have bought their supply apparently from other prisoners rather than from the officials. Penal institutions, in which we could do great things to cure the habit, have thus become one of the greatest sources of its spread." Dr. Hamilton Wright can tell you something about this on page 47 of Senate Document No. 377.

Is your grocer peddling dope? Ours is, and the Massachusetts State Laws can't touch him.

Can your night messenger get all the dope he wants and for any one he wants it for? Bring it to you or mail it you? When you go to Boston or New York, New Orleans or St. Louis, Kansas City, Atlanta or Richmond, Terre Haute, San Francisco or Cincinnati, Minneapolis, Utica or Detroit, Philadelphia or Chicago, it might be well to try the experiment. (Private reports in my possession made by the investigator of the National Child Labor Bureau and covering New York City, two on Utica, one on Georgia, one on Terre Haute, four on New Orleans.)

Is the post office sending dope through the mails?

Did you know that it is forbidden to use the mails for the transmission of habit-forming drugs? Does this apply to a cheerful concoction like *M's. H.*, containing 6 grains of morphine sulphate and 16% alcohol to the fluid ounce? This stuff which breaks the law eighteen times is to all intents and purposes exculpated by the law, for it is a proprietary medicine—it has the freedom of the postal service. Uncle Sam lets such things pass unchecked to form the little addicts of the nursery.

Did you know that the drug trade, held up in China, is unloading itself on the United States?

Do you know what opium did to the Chinese?

Do you know what opium and cocaine do to us as individuals?

Did you know that one month of morphine taking would make a drug victim out of almost anyone?

Did you know that a week of steady cocaine taking would make a criminal in impulse and probably in action of a man or woman?

Do you know what opium and cocaine will do to us as a nation?

Did China know?

What facts do we know about the 4,000,000 people in this country, more or less, who are addicted to the use of opium and cocaine?

Wouldn't you be interested to know whether ignorance or inheritance is the biggest manufacturer of degenerates?

Read *Farmer's Bulletin 393* by Doctor Kebler of the United States Bureau of Chemistry, or *Senate Document 377* by Dr. Hamilton Wright, or *Narcotic Drug Diseases* by Dr. George Pettey, or Doctor Kebler's *Present Status of Drug Addiction in the United States.* They can tell you!

Did you know that in the last forty years the amount of opium imported into the United States has more than doubled? Dr. Hamilton Wright knows.

That we, with a population of some 90,000,000 import over 400,000 pounds of opium per annum? Doctor Wright knows and tells us all about it in *Senate Document 377.*

Did you know that 90 per cent. of the opium imported is used for illegitimate purposes? Doctor Kebler is responsible for this figure. Read first paragraphs of his *Present Status of Drug Addiction.*

Did you know that as against a 351 per cent. increase in our importation of all forms of opium for the last five decades there has been but 133 per cent. increase in our total population? Doctor Wright knows. See page 42 of *Senate Document 377.*

Did you know that Italy, with a population of one-third ours, uses but 6,000 pounds of opium per annum? That Austria Hungary, with a population half ours in size uses but 3,000 pounds?

Do you realize that narcotism is a state of mind and body that requires two lids, one the alcohol lid and the other the opium and cocaine lid? What are we going to do about getting this second lid on to stay?

Did you know that *WE*, not China, are now the first opium-eating nation in the world today?

Then what are we going to do about the curse of narcotism in America?

ENFORCEMENT OF THE TENNESSEE ANTI-NARCOTICS LAW.

Lucius P. Brown,
State Food and Drugs Commissioner of Tennessee.

Read before the General Sessions, American Public Health Association, Jacksonville, Florida, December, 1914.

THE Act of 1913, now in force in Tennessee governing the method of sale of certain narcotic drugs, and its method of enforcement, appears to have brought to light some rather interesting facts, hence this consideration of it is presented.

This act covers the compounds and derivatives of opium and of coca-leaves, and the central idea is the restriction of these drugs to their legitimate use in medicine. While following the general lines of the Act of Congress of December 17, 1914 (the so-called Harrison Act), governing the interstate traffic in such drugs, the Tennessee Law goes further than that act, and limits dispensing or distribution of the drugs to three classes, namely, to registered physicians, dentists or veterinary surgeons, in the course of professional practice only, to registered pharmacists in pursuance of prescriptions of physicians, dentists or veterinary surgeons, and to the sale or distribution by wholesale druggists, dealers or jobbers within the state, to retail dealers; provides that a register shall be kept of the purchases and sales, and has in addition, that provision of the old New York Cocaine Law, which provides for the dispensing of cocaine only in solution. With the dispensing physician it is more strict than the Harrison Act, and handles him more effectually. The State Food and Drug Inspector, in whose charge is placed the enforcement of the act, and the secretary of the State Board of Health, are made a board for the drawing up of regulations for the enforcement of the act, and it is in these regulations that the chief departure from the usual methods of enforcement of like legislation consists. That one of these regulations in which this departure chiefly consists is reproduced below in full. It provides for the refilling of prescriptions for use by persons at present addicted to the use of the drug, in order to minimize suffering among this unfortunate class, and to keep the traffic in the drug from getting into underground and hidden channels.

Since a very large proportion of the medical profession has either lost sight of the fact that the habitual use of an opiate produces a true disease, or never knew it, it is thought well to remind them of that fact. It will further be recalled that one of the first effects of an opiate is to lessen the secretions of all mucous surfaces of the body. This effect persists throughout the whole course of the addiction, no matter how long continued. Addicts are constantly constipated; and the use of a purgative by them is almost as regular as the use of their drug. The symptoms of abrupt withdrawal of opiates from an addict, it will also be recalled, are as below, but these do not always occur in the order named. There is usually, in the beginning, a general malaise, with restlessness, precordial distress, irregular heart action, pains in the back and limbs, nausea, vomiting, diarrhœa, general exhaustion, with possible mania, and finally complete physical and mental collapse. The mania may, and not infrequently does, assume a suicidal form. The collapse occasionally ends in death, and is always accompanied by intense suffering, the details of which can be had by any interested person from any one of several different text-books.

It follows from this condition of affairs, that the sudden general stoppage of the sale of the drug except on prescription would certainly result in great suffering to the indigent class of addicts, possibly in many deaths, and certainly in driving the traffic into channels outside the law. It is therefore to be avoided if possible. It is further obvious that there is quite sufficient secrecy about this disease without forcing it to any greater degree of concealment. The only other alternative to such permit system as is provided for in the Tennessee Regulations, is state curative treatment for all indigent addicts, with permanent commitment of those incorrigible to institutions for the feeble-minded. It will at once be apparent after reading this paper, that such a proceeding is out of the question in most states, because of the enormous number of persons involved.

I want to call particular attention here to the fact that the habitual use of cocaine is not a disease, but a habit, inasmuch as it does not produce such toxemias as are consequent on the use of morphine; therefore its abrupt withdrawal results in no such untoward consequences as with the latter drug. No provision, therefore, need be made for the relief of persons addicted to it.

The regulation mentioned, is as follows:

REGULATION III.

Refilling Prescriptions.

No prescription coming under this law can be refilled except by permission of the secretary of the State Board of Health and the Pure Food and Drug Inspector. Said permission can only be given by a permit to be obtained from these officials under the following conditions, namely: The person desiring same must apply to said officials according to the following form and that only. Note that this form must be followed exactly, namely:

APPLICATION FOR PERMIT.

....................Tenn., ... 191..

DR. R. Q. LILLARD AND LUCIUS P. BROWN,
Nashville, Tenn.

Gentlemen:

I, ..., do hereby apply to you for permission to have refilled the accompanying prescription for an opium compound. I hand you herewith certificate of Dr. .... that I require same, and that I have been a continuous user of said drug for .... years. My druggist is .... at ....

Very respectfully,

....

(Applicant must not fill these blanks.)

Application Number.....................	Sex..............	Color.............
Permit Granted........................	How drug is taken	Needle Mouth Nose
Date.................................	Cause of habit.........................	
Permit Number........................	....	

The physician's certificate must be in the following form:

PHYSICIAN'S CERTIFICATE.

I, ..., a licensed doctor of medicine, in ....
PHYSICIAN SIGN HERE.
County, do hereby certify that .... the applicant for permit to refill prescription which this affidavit accompanies, is personally known to me to be a regular user of an opium conpound and to have been such user thereof for the term of........ years. In my judgment, the opium compound called for by this prescription is absolutely necessary to said applicant for the maintenance of life and reason, or because of physical disability, as follows: ....

....

The applicant is about .... years of age and requires the equivalent of about........ grains of morphine per month.

I certify that all statements herein made are true and correct.

Witness my hand and seal this .... day of .... 191..

Signed.................................... M. D.

STATE OF TENNESSEE,
COUNTY OF.........................

Personally appeared before me ...., a Notary Public (Justice of the Peace) in and for the County aforesaid.......................... M. D., who is personally known to me, and makes oath that the facts stated above are true.

....

My commission expires............................

For the information of all persons concerned, the form of permit is given below; any paper purporting to be a permit and not in this form is spurious.

OFFICE OF PURE FOOD & DRUG INSPECTOR,
NASHVILLE, TENN.

PERMIT TO REFILL PRESCRIPTION CONTAINING A NARCOTIC.

....Druggist,

.. ..

.. . .

You are hereby authorized to refill the accompanying prescription when duly stamped, sealed and countersigned by one of us, and when same is numbered to correspond to this permit. This prescription may be refilled as often as necessary, but the total amount of narcotic consumed must not exceed..................................per month.

You are to copy this prescription, make note of the number of this permit, and immediately return both original prescription and this permit to this office for cancellation.

This permit is good until......... ....

Respectfully,
R. Q. LILLARD, M. D.
LUCIUS P. BROWN.

Permit Number
Date Granted......

The person receiving the permit as above noted, must surrender same to the pharmacist who first fills the prescription. The pharmacist receiving it must retain said prescription, register it in a book provided for the purpose, making a copy of it, and return the original at once to the office of the Food and Drug Inspector for cancellation. A druggist receiving said prescription with permit for refilling, is expected to notify the Food and Drugs Department in case of improper use of the permit, and the death of the holder, of course, automatically revokes it. The Board for Rules and Regulations does not bind itself to give a permit to every person applying to it, but will give said permit only in its discretion. Any permit so given may be revoked by written notice to the dealer with whom it is filed.

No permit calling for the refilling of a prescription containing a compound or derivative of coca-leaves will be given.

This permit system, as will be noted, is as rigidly guarded as it is possible to make it through a physician's certificate. Although it has been abused in a few cases, its good results appear to far outweigh its defects. It has moreover resulted in giving a considerable mass of data which could not be procured in a reasonable time in any other way. An effort is made, at every renewal of a permit, to lessen the amount of the drug allowed. This results usually in improvement of the addict's condition. Before adopting the regulations, they were discussed at public hearings with representatives of all trades and professions interested, and are now heartily supported by every class.

After twelve months of operation, there were on January 1, 1915, registered under this system, 2,370 persons of all ages and colors.

Table I shows the proportions of male and female addicts, together with the proportions of the various drugs used. It will be noted that there are about twice as many women as men in the whole list. The proportion

TABLE I.

	Totals.		Morphine-users. (86% of whole number.)	Users tincture of opium. (7.25% of whole number.)	Gum opium-users. (5.06% of whole number.)	Heroin-users. (1.3% of whole number.)	Miscellaneous drugs (inc. codeine, glyco-heroin, papiene, etc., 5 persons only).
	Number.	Percentage.					
Males . .	784	33.1	33.1	25.0	33.3	77.4	40
Females.	1,586	66.9	66.9	75.0	66.7	22.6	60
	2,370						

of the sexes in the use of morphine and gum opium is about the same as that shown by the users of all drugs. Women seem to be especially prone, however, to use laudanum; with heroin, on the other hand, the conditions are reversed. Inasmuch as this drug is used almost altogether for dissipation, it is probable only a small proportion of its users in the state are registered.

TABLE II.

	Morphine. Grs.	Tincture of opium. Ozs.	Gum opium. Ozs.	Heroin. Grs.
Males.	8.86	.49	.31	4.66
Females.	8.22	0.57	.2	4.66

Table II shows the dosage according to sex. It will be noted that ordinarily men seem to use more of the drugs than women, the only exception to this being laudanum, where the women have a little the advantage. With heroin, only seven women use it, and since one of these, from the red-light district, uses 750 grains per month, there is a strong suspicion that she is dividing with some friend; leaving her case out of consideration, the amount of heroin used by each man would be very much larger than that used by each woman.

TABLE III.

	Oldest.			Youngest.			Longest addiction.			Shortest addiction.			Averages.		
	Age.	Length of addiction.	Age began.	Age.	Length of addiction.	Age began.	Age.	Length of addiction.	Age began.	Age.	Length of addiction.	Age began.	Ages.	Length of addiction.	Age began.
Male . . .	85	20 yrs.	65	17	3 yrs.	14	72	50	22	50	2 mos.	50	49	11 yrs., 2 mos.	37 yrs., 10 mos.
Female. .	90	8 "	82	22	3½ "	18½	55	50	5	69	1 "	69	19	11 yrs., 6 mos.	37 yrs., 6 mos.

Table III, giving some maxima and minima as to ages and lengths of addiction, together with some averages, is of considerable interest. As regards the oldest users, honors are fairly easy between the sexes. Among the youngest users, the males lead. This boy is a heroin addict who apparently contracted the disease by infection, just as the disease is usually contracted by its devotees. In the matter of age at which addiction began, as will be noticed under the head of the longest addiction, women appear to have the lead, but inasmuch as this patient has been taking the drug since she was five years old for a spinal trouble, her case is hardly a fair criterion. There were, however, two other women who have been using the drug for fifty years, and as will be noted, the longest addiction among men is of the same period. In the case of the column headed "Shortest Addiction," it is apparent that physicians are using the permit system to enable them to care for patients with an incurable disease.

The averages are the important portions of this table. They appear to be very much the same—with the women a little in the lead. Note that this further bears out the indications of Table IV, and that these figures and those of Table IV, appear not to bear out certain other observations showing that men begin the drug habit earlier.

TABLE IV.

Age-Periods.	Males.		Females.		Both sexes.		Proportions males to females at each age-period.	
	Per cent. in each period.	Excess over females, same age-period, in percentages.	Per cent. in each period.	Excess over males, same age-period, in percentages.	No. cases.	Per cent.	Males, per cent.	Females, per cent.
15 to 24......	2.6	0.9	1.7		49	2.0	42.8	57.2
25 to 34......	10.5		13.7	3.2	301	12.7	26.4	73.6
35 to 44......	19.8		23.4	3.6	531	22.4	29.4	70.6
45 to 54......	29.3	2.9	26.4		650	27.4	35.4	64.6
55 to 64......	20.4	2.0	18.4		452	19.0	35.4	64.6
65 to 74......	13.1	1.0	12.1		295	12.4	34.7	65.3
75 to 84......	3.8	0.4	3.4		84	3.5	33.7	66.3
85 and over...	.1		.4	.3	8	.3	12.5	87.5

Table IV is possibly the most instructive of this series, showing as it does, the per cent. of each sex at different age-periods. Note in this the great preponderance of women from age 25 to age 44. In these two age-periods they form nearly three-fourths of the whole number of addicts, and this preponderance appears to so far prevail into the next period that 63.5 per cent. of all females are from 25 to 55 years of age, as against only 59.6 per cent of all males. It will be at once apparent that the first twenty years of this period is about the age when the stresses of life begin to make themselves felt with women, and includes the beginning of the menopause period. It appears reasonable, therefore, to ascribe to this part of female life, no small portion of the addiction among women. Again it seems fairly safe to ascribe the slightly larger proportion of men in the first ten-year life-period to the fact that this is about the age when dissipations are commonly taken up, these being more distinctively a male attribute.

Table V shows the statement of the attending physician as to physical disabilities of addicts. This table necessarily is not an exact one. For instance, the names of the diseases given would hardly, as a whole, satisfy a registrar of vital statistics. They are, however, the best that can be done, and they are given for what they may be worth. They appear to possess a not inconsiderable degree of value. Certainly the fact that the physician reports, in over one fourth of all cases, that there is at present no physical disability, indicates that however the disease of narcotism may have been contracted, there is at present no physical disability calling for the use of a narcotic. Again, under the comprehensive title of "Female Troubles" is probably grouped a large volume of disability which accounts for a very considerable proportion of the narcotism among women. It makes up 9.3 per cent. of all cases listed, and 13.9 per cent. of all female cases. This table, however, being compiled largely for the purpose of instituting comparisons between the sexes, obviously does not show the figures for these so-called "Female Troubles."

Rheumatic pains, neurasthenic or neurotic conditions such as shown in the lines headed neuralgia, nervousness, etc., and disturbances of the digestive tract, are all characteristic withdrawal symptoms, and possibly no great weight should be attached to the figures given therefor. Nevertheless, it is to be noted that rheumatism appears more prevalent among men, as might be expected, on account of the greater exposure of men to weather conditions, while neurasthenic or neurotic conditions are more prevalent among women. Again, "Accident and Operation" as present causes, are greatest among men, and "Habit after Illness" among women. From the small proportion of the latter condition shown, namely 5.6 per cent. in both sexes, it is not to be inferred that only this number of cases is due primarily to that cause. Other investigations by me, as well as the experience of all other writers on this subject, would appear to indicate that well over 50 per cent. of existing cases of narcotic addiction are due to the indiscreet administration of drugs by physicians.

Venereal diseases appear to account for no inconsiderable proportion of the trouble, and are naturally greatest among men, tuberculosis being greatest among women. It appears likewise, from these figures, that only 5.2 per cent. of permits were issued to incurables, including in this list tuberculous patients (the other incurables being cancer and like diseases); therefore, 90 to 95 per cent. of the persons using narcotics do so entirely unnecessarily.

TABLE V.

Name of complaint.	Per cent. of both sexes exclusive of "female troubles".	Males.			Female (exclusive of female troubles).		
		Per cent.	Excess (E) or Defect (D) over column 1. (Both sexes) (in percentages).	Excess over females. (in percentages.)	Per cent.	Excess (E) or Defect (D) over column 1. (Both sexes) (in percentages).	Excess over males (in percentages).
Physician says "None"	26.7	24.4	D 2.3		27.8	E 1.1	3.4
Not stated in application	8.8	8.1	D. 0.7		8.9	E. .1	.8
Rheumatism	14.3	19.0	E. 4.7	7.8	11.2	D. 3.1	
Neuralgia	7.4	4.9	D. 2.5		8.8	E. 1.4	3.9
Habit after illness	5.6	4.5	D. 1.1		6.3	E. 7	1.8
Accident and operation	4.4	6.6	E. 2.2	3.4	3.2	D. 1.2	
"Nervousness"	4.1	2.5	D. 1.6		5.0	E. 9	2.5
Diarrhœa (including dysentery)	3.2	4.0	E. 0.8	1.3	2.7	D. .5	
Kidney and bladder troubles	3.1	1.9	D. 1.2		3.8	E. 0.7	1.9
Incurables	2.8	2.3	D. 0.5		3.0	E. 0.2	0.7
Asthma	2.8	3.6	E. 0.8	1.4	2.2	D. 0.6	
"Stomach trouble"	2.6	3.2	E. 0.6	0.6	2.3	D. 0.3	
Tuberculosis	2.4	1.5	D. 0.9		3.0	E. 0.6	1.5
"Bowel trouble"	2.1	2.0	E. 0.3		2.1	E. 0.0	0.1
Ulcers on limbs, etc.	1.3		D. 1.3		1.8	E. 0.5	1.8
"Heart trouble"	1.2	2.2	E. 1.0	1.6	.6	D. 0.6	
Venereal diseases	.9	1.5	E. 0.6	1.0	.5	D. 0.4	
"General bad health"	.8	5	D 0.3		1.0	D. 0.2	0.5
"Headache"	.7	.9	E. 0.2	0.3	.6	D. 0.1	
Miscellaneous	4.8	6.4	E. 1.6	1.2	5.2	E. 0.4	

As to the distribution of the disease between the two races, it is to be noted primarily that Tennessee possesses a considerable negro population—in the neighborhood of one fourth of the whole. Our data on the racial distribution are not very exact, because only in cases where a specific statement is made, can we be reliably informed as to the race of the applicant. Figures which we believe to be fairly exact indicate that not over 10 per cent. of our permit holders are colored. This is due in part to the fact that the average negro avoids as far as possible any contact with an official, and to the fact that the negro appears to use relatively less morphine, and more cocaine, than the white man.

An interesting fact brought out by our records is the comparison between the different sections of Tennessee. East Tennessee is a mountainous, well-drained country with a salubrious and rather bracing climate. West Tennessee, on the other hand, lying between the Mississippi and Tennessee Rivers, is rather flat, of low elevation, with much marsh-land and therefore with a considerable proportion of malarial troubles. East Tennessee appears to have one addict in 1,359 of the population, while West Tennessee has one addict in only 928. Moreover, West Tennessee, largely a cotton-growing section, has relatively much the largest negro population in the whole state, which would further increase the proportion of addicts among the white population of this section. The fertile lowlands of the South are commonly credited with having an unusually large proportion of addicts, and these figures are in accord with that reputation.

As to what proportion of the total addicts of Tennessee are registered under this permissive system, guesses only can be given. It seems safe to say that not over one half of the addict population is registered—possibly not over one-fourth. Taking, however, the lower figure, it would appear that there are in the neighborhood of 5,000 addicts in Tennessee. The state has about 2.3 per cent. of the whole population of the United States. It is an agricultural state, and consequently, living conditions appear to be not so exhausting as in more thickly settled communities, nor life as a rule, so intense. In order to get the whole number in the United States, we may multiply our figure of 5,000 by 43. This gives us about 215,000 addicts. Probably, however, in order to allow for conditions in cities and industrial communities, we ought to add 25 per cent. to this number, giving not less than 269,000 addicts in the whole United States. In my opinion this is a very conservative calculation. It shows by no means so many as sensational writers appear to want us to believe, and while it thus shows better conditions it is bad enough. An opium addict even at work shows anywhere from zero efficiency up—hardly in any case showing 100 per cent. efficiency. In addition to this there is a large proportion of them that must be taken care of by friends and relatives or at community expense. The annual cost of the drugs actually used in Tennessee, calculated at retail prices, is about $145,000.00. On the basis just suggested for the population, this would make the annual expenditure for the drugs $15,597,500 for the whole United States. Ten per cent. of this may possibly be regarded as necessary. Deducting that, we should still have $14,038,000 as the amount expended by addicts simply to satisfy the addiction—a sheer waste of money, to say nothing of the damage to the community otherwise, which is appalling.

In a paper read before the American Public Health Association at the Denver meeting, Doctor Terry called attention to the public health aspect of drug addiction. This side of the matter cannot be too strongly emphasized. I have already attempted to give some idea of the extent of the infection and of its consequences. Contagion is undoubtedly a very frequent method of spread. I have met many instances in which more than one member of a family was infected, the first case, acquired accidentally or through a physician, infecting other members of the family largely through a certain tendency on the part of the addict, particularly in the early stages, to introduce others to the delights of the addiction. Certain physicians unhappily leave behind them a sad trail of addicts. In most instances these physicians are themselves addicts. In other cases, the physician may for some reason or other be particularly fond of the use of the drug, and ignorant or heedless of its consequences.

In this connection, the addiction to heroin (diacetyl morphin) is not to be lost sight of. This, as is well known, is a drug of recent introduction to the Pharmacopœia, and while it undoubtedly has considerable value, my observation has been that the damage which it does far outweighs its general good. Heroin addiction is spread almost altogether by infection. It has a very pronounced stimulant effect, and for that reason is largely used by boys and young men as a means of dissipation. It is for this purpose chiefly used by inhalation, a quill or joint of cane being inserted into the nostril, the other end of which is thrust in the powdered drug held in the palm of the left hand. The use may be begun for the relief of such minor troubles as headaches, fatigue, etc., especially by young people who work. In this instance, the tendency of the drug addict to admit others to his joys is very pronounced, with at times the additional incentive that the addict spreading the habit may act as a salesman of the product. The largest number of its users, aside from the inhabitants of the segregated districts, we have found to be youngsters from 15 to 25 years of age. Under present conditions, it is almost a certainty that, in large cities, in every place where a number of boys and young men are employed together there will be a certain amount of heroin addiction. Thus several cases have come to me where young men have stated that they had acquired the habit when employed as bell boys in hotels. It likewise seems to be a particularly difficult habit to cure, as might be expected from the character of its devotees, and the sale of this drug ought to be hedged about with just as rigid and drastic restrictions as are possible to enact into law.

I shall not undertake to point out in detail the dangers involved in the use of these narcotic drugs. The manifestations of the disease differ essentially from those of alcohol. The person under the influence of alcohol usually makes a nuisance of himself to everybody with whom he comes in contact because he is inclined to be boisterous, demonstrative and noisy.

The opium addict, on the other hand, appears to desire nothing so much as to take himself and his troubles to a secluded spot where he may seek such relief from his obsession as he can quietly secure. Shame at being fast in the slavery of a self-induced force from which he cannot escape probably plays no small part in this tendency. The drug addict is usually therefore more to be pitied than censured, and every effort should be made to help him attain a fulfilment of the desire, which is almost universally present, to get rid of the disease.

The United States is to be congratulated on the passage of the Harrison Act. While not by any means a perfect measure, it is an excellent piece of legislation as a whole, and will go far towards correcting the grosser manifestations of this menace to American civilization. But I think it will be readily perceived that if it is to accomplish the purpose for which it was designed some method will be necessary of caring for those persons who are already in the clutches of the drug. A very large proportion of them are nearly or quite paupers. Either state aid or, where state aid is not possible, whether for economic reasons or because of the general ignorance on the subject, some other method such as that adopted in Tennessee, will be necessary not only to prevent an amount of suffering which will in the aggregate be vast, but also a violating of the law which will tend in large part to nullify it.

In closing, I want to make a plea for an intelligent and scientific study of this subject. It is so new, and the mental position of the large majority of the medical profession toward it has been of such a nature, that it has not had from alienists and from men specializing in allied lines the attention to which its importance entitles it. It appears moreover to deserve the best thought of the medical profession generally, and in such work the physical aspect of the case should never be overlooked. The drug addict is a sick man both physically and mentally, and should be studied and treated as a sick man and not as one always wilfully delinquent.

THE INDEPENDENT ATTITUDE OF THE "DOPE USER"—AND WHAT ARE WE GOING TO DO ABOUT IT.

DONALD McCASKEY, M. D.,
Lancaster, Pa.

Read before the General Sessions, American Public Health Association, Jacksonville, Fla., November 30–December 4, 1914.

DURING the last meeting of the International Opium Commission held in Shanghai, China, one of the delegates from China, Mr. Tang Kuo-an, an official of the Fifth Civil Rank, and a member of the Waiwupu, and the most able and scholarly delegate, sounded the keynote upon which the success of China's effort to stamp out the opium problem among its four hundred million of inhabitants was built when he declared in a speech: "What China needed most, was sympathy."

It is this very question of sympathy and the lack of sympathy around which our success or failure in dealing with the preventive phase of this dope problem hinges. We might as well face the fact squarely. There is little use for us to base our ideas upon the emotional stage, which finds its chief expression in merely agitation. We want to get down and deal with ascertained facts. It is only upon the basis of these ascertained facts that we are enabled to really reach certain conclusions of such a practical kind that we can definitely fix a responsibility and make our efforts prove helpful.

Within the makeup of every individual character there is a certain subtle and characteristic attitude of individual independence. Every one of us, for example, prefers to select in our way, and according to our own judgment, certain kinds of books we like to read, certain kinds of music we like to hear, and certain kinds of congenial companionship among our friends that we like to enjoy. We personally prefer to exercise our own prerogative as to what we shall and shall not do so long as our actions do not interfere with our neighbors. When, however, any action of ours based upon our own individual and independent wilfulness proves self-destructive or of injury to the body politic we term society as a whole, there is a relationship of responsibility which devolves upon organized society to take command of the wilfully intemperate individual and to pilot him upon his course.

"If a man or woman choose to go to the dogs it is his or her own lookout so long as their actions do not drag anybody else down with them" we reason, but as the ascertained facts of this most practical world have revealed to us that dope users who deliberately hit the toboggan *drag others down with them*, because of their wilful and diseasedly independent spirit, it becomes necessary that we devise some method of action of a practical character to combat this waywardness. Because, therefore, the dope user wilfully and diseasedly exercises his own individual faculty of independence and chooses to ruin his faculties and those about him, it becomes highly vital that we, living in his community where this is one of our local problems, step into the breach and take a personal hand in the fray.

Some years ago, out of a simple kindly feeling toward the man, I permitted a certain gentleman of high birth and standing to occupy a place in our household as a personal guest for several months. I had no suspicion at the time that this guest possessed any abnormal desires nor had lost all his ordinary powers of resistance. One day I noticed an unusual nervous tremor about our guest and my suspicions became aroused. One evening late, after we had all retired, I had occasion to arise from bed and go down to my back office. In bath robe and slippers, the trip downstairs and through the house corridor to the office was made most quietly, when to my amazement I noticed a light in the office and my personal guest just about to help himself to some drugs which he had discovered on a convenient and very accessible shelf. Caught in the act "with the goods" as the saying is, and in spite of all his chagrin and annoyance, my guest nevertheless attempted to deliberately lie and excuse his presence in my back office at such an unearthly time.

Why did he do this? Why did he attempt to make me believe he was not a dope fiend and was not in search of his favorite drug? It was merely because this man still thought there might be a possibility of protecting his good name, or at least whatever was left of his former good name. Let me quote another instance of a horse jockey that would deliberately call upon me, confessing frankly that he was a cocaine fiend, and that all he asked was for a good heavy "sniff" of the powder. Here we have an instance of the dope user who possesses an independence of a different type, and but recently a patient consulted me for help, stating that his wife was a morphine user and had been consuming eight grains a day; that she wished to stop, but could not reduce her dosage below this amount without feeling a great need for support. Upon my investigating the case, I found that instead of the patient being the man's wife, he himself was the victim. What little independence he still possessed was being utilized in his effort to shield himself as much as possible from the disgrace with which he knew he was being regarded.

We are dealing with a condition of reality, and not a theory. So long as a dope user who has become a habitué, or is growing into the stage of an habitué, can procure his favorite drug, he or she is going to do so whether he must lie, beg, borrow or steal to attain his end. The quicker we recognize this fact, the better. It has its basis upon supreme and primitive instincts of independence and we must acknowledge it in our efforts to find a solution for the relief of these people as individuals and for the betterment of our local community life known as society. We can pass legislation restricting the importation of opium, and regulate by national law the manufacture as well as the sale of all habit-forming drugs. We may likewise in each of our states pass legislation most radical and specifically explicit as to the sale of habit-forming drugs. We can even proceed still farther and narrow down our efforts to solve this problem of the habit-forming drug fiend into a local, or municipal, or city problem. This, in my judgment, is where it fundamentally depends for its final solution. Each one of our American citizens might follow the wonderful example of Jacksonville, Florida, who, under the leadership of its Health Officer, C. E. Terry, led the campaign to secure the city ordinance making suitable provisions for the treatment of the Jacksonville dope users. In my judgment, Doctor Terry's plan is the best that has yet been advanced. The Jacksonville method is based upon actual, efficient, personal contact of the physician with the dope user. This contact is not merely from the standpoint of the scientist, but is also from the standpoint of the simple human-hearted fellow American who has true sympathies for the underdog. Of course, we all realize why the underdog has reached his or her present position, but the fact remains that we must deal with him upon a basis of plain humanity. Speaking from the standpoint of a physician we are not going to have the complete solution in the eradication of this habit-forming drug problem come entirely from the ranks of the medical profession. We cannot have it come as a wave of reform from the ranks of the druggist. Neither can we have a lot of legislation work out as an absolute solution. Certainly we are not going to find the channel of cure for the drug habit in our police circles. Heroin, cocaine, morphine are poisons to the human system exactly as is whiskey, wine, beer and other alcoholics. And we must, in my judgment, get down to the solution of this problem along the lines similar to the plan of Doctor Terry in his Jacksonville, Florida, city ordinance plan of procedure. (Oftentimes it may be that a certain individual dope user may need strenuous measures applied much as did the young wife who administered treatment to her husband the first time he came home deadly drunk. The wife and a friend of hers wrapped her drunken husband in a sheet, then the wife took a strong stick and applied it strenuously much as does a school-teacher apply it to the back of the bad boy. The beating soon sobered the husband, since which time he has not only never returned home drunk, but he absolutely stopped short in the use of all alcoholics from that time on.) This method, of course, would not apply indiscriminately to every class of dope users, but there are certain instances where it would prove to be the most valuable kind of medicine. Certainly, strenuous measures are absolutely necessary. Sympathy, however, intelligent, kindly sympathy is equally necessary. Let each city, through its health officer, try to work out its problem on this basis, and until a better plan is suggested, I know of none so practical as that embodied in its city ordinance and in use at present, right here in Jacksonville, Florida.

PUERPERAL SEPTICÆMIA.

W. H. Guilfoy, M.D.,
Registrar of Records, Board of Health, New York City.

Read before the Section of Vital Statistics, American Public Health Association, Jacksonville, Fla., November 30–December 4, 1914.

DEFINITION.

PUERPERAL septicæmia may be defined as an infectious disease attacking females within a few days after the delivery of the product of human conception, irrespective of the period of uterogestation.

ETIOLOGY.

All cases of puerperal septicæmia are the result of microörganisms gaining entrance into the genital tract either from the hands of physician, nurse or other attendant, from instruments, dressings, washes or from within the body originating at a point distan't from the genital organs as in septic sore throat, typhoid fever and other infectious diseases. The most common bacteria capable of infection are the streptococci, the staphylococci, gonococci and colon bacilli.

HISTORY.

The honor and glory of discovery of the cause of puerperal septicæmia have been claimed for two widely known physicians, Oliver Wendell Holmes of Boston, Mass., and Semmelweiss of Vienna. In April, 1843, Holmes published in the *New England Quarterly Journal of Medicine and Surgery* his celebrated essay on the Contagiousness of Puerperal Fever, and in it his object is laid down in the following words, "The object of this essay is to prove that puerperal fever is sometimes carried from patient to patient by medical assistants." He gives credit to a Doctor Gordon of Aberdeen, who in the year 1795 wrote an article in which he stated that, "This disease seized such women only that were delivered or visited by a practitioner or by a nurse who had previously attended patients affected with the same disease. I arrived at that certainty in the matter that I could venture to foretell what women would be affected with the disease upon hearing by what midwife they were to be delivered or by what nurse they were to be attended." Dr. T. C. Albutt of England states that a Doctor Walsh published an essay similar to Gordon's ten years before that of the latter.

On the other hand, the adherents of Semmelweiss claim that he was impressed with the same idea about the same time as Holmes, but while the latter contented himself with the publishing of his essay, the former made the subject his life work; it is probably true that Semmelweiss's statement that the cause of this disease was due to the carrying of decomposed animal matter by the examining finger, the operating hand and the obstetrical instruments, met with the derision of the head of almost every chair of obstetrics in Europe, and that to him in greater measure than Holmes is due the honor of determining the etiology of puerperal fever.

Prevalence.

Puerperal septicæmia is found wherever human pregnancy and its results occur. In England and Wales in the decennium 1891-1900 there were 46,591 deaths from childbirth and puerperal septicæmia, 20,813 being credited to the latter. In the city of New York during the past ten years there were 2,630 deaths reported from this cause to which may be added 383 deaths from criminal abortion, nearly all of these latter being due to septicæmia.

Notification.

Puerperal septicæmia is infectious, but many countries, states and cities do not require notification thereof. It is not included among the notifiable diseases in the Model State Law for Morbidity Reports, as adopted by the Eleventh Annual Conference of State Health authorities with the Public Health Service, held at Minneapolis in June 1913. The Sanitary Code of the Department of Health of the City of New York contains a provision for the reporting of this disease to the health authorities and provides a punishment for noncompliance therewith, but the pressure of the enforcement of more important sanitary measures has resulted until the last year or so in the neglect of its enforcement.

Case Fatality.

In Semmelweiss's report in the *Zeitschrift der Kaiserlichen Königlichen Gesellschaft der Aertze zu Wien* in December 1847 and April 1848 are found statements that in the period 1838-1846 there were 25,000 cases credited to physicians with a mortality of 9 per 100, while among 21,904 cases credited to midwives the mortality was 4 per 100.

In Manchester, England, in 1906 there were 103 cases with a mortality of 29 per cent. It is rather difficult to obtain a true case fatality, except from hospital statistics wherein it is probably higher than in clinical experience outside an institution, as the severe cases are generally sent to the institution, the milder cases being treated at home.

The death-rate from this cause is generally based on one thousand births reported, that based on the one thousand women at all ages being unsatisfactory and likely in some instances to give fallacious results. The best method is to base the rate upon the deaths of puerperal women at various age groups per one thousand births to mothers at the same age groups, but ordinarily these latter figures are not available.

The following table gives the mortality of some large cities of the world based on one thousand births reported.

DEATH-RATE FROM PUERPERAL SEPTICÆMIA, PER 1,000 BIRTHS REPORTED DURING QUINQUENNIAL PERIODS 1880–1884 AND 1905–1909.

Rate Per 1,000 Births.

Cities.	1880–1884.	1905–1909.	Decrease Per Cent.
Bremen	3.1	0.5	84
Berlin	3.2	3.5	9*
Dresden	3.4	2.8	18
Budapest	3.7	2.0	46
Paris	4.3	3.5	19
London	2.5	1.4	44
Liverpool	0.5	1.0	100*
Edinburgh	2.7	1.5	44
Milan	1.6	2.0	25*
Amsterdam	2.5	0 6	76
Stockholm	4.9	1.0	80
Moscow	5.3	1.5	72
St. Petersburg	2.0	1.2	40
Vienna	4.7	3.1	34
New York	...	2.1	....

It is gratifying to note that nearly all the cities mentioned show a much decreased mortality, the exceptions being Berlin, Milan, and Liverpool. The highest mortality prevailed in Paris and Berlin, the lowest in Bremen. The figures for the quinquennium 1880–1884 are not available for New York, as the basis—the registration of births—is quite incomplete for that period, but there undoubtedly has been a considerable decrease, as shown by the fact that in the quinquennium 1871–1875 there were 866 deaths reported from puerperal fever against 1,381 deaths in 1909–1913, the deaths having increased almost 60 per cent., the total population 400 per cent.

It is noteworthy that the cities showing a rate above 3 per 1,000 births are those that possess a worldwide reputation as to gaiety and moral laxity.

In England and Wales in 1912 there were 1,216 deaths from puerperal fever, these figures do not include 119 deaths from abortion which were probably septic deaths. In the registration area of the United States 3,905 deaths were reported in 1912 from this cause, so that we are justified in saying that 6,200 women died from this cause in the whole United States in that year.

The rôle played by the medical or other attendant in the causation of this disease has created quite a deal of comment; the first conclusion jumped at is that the midwife by reason of her untidy appearance and her general reputation for slovenliness is the most important factor in this infection, but repeated attempts to prove that the physician is innocent of complicity in the death have met with distinct failures. Twenty years ago

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* Increase.

Doctor Tracy, the then Registrar of the Department of Health of the City of New York, compared the deaths of one hundred females from this cause with the certificates of birth on file and found that 50 per cent. of the births were reported by physicians. More recently a personal investigation of 50 deaths from this cause by one of the brightest social workers showed that 25 of the deaths were attended from the commencement of labor by physicians. Out of 105 cases of puerperal sepsis reported during the first nine months of this year, 20 cases were at some time attended by midwives, 67 were treated by physicians or in hospitals, 1 by a nurse and information as to medical attendance could not be ascertained in 17 cases.

Viewed from the standpoint of birthplace of mother and reduced to comparable figures by taking into consideration the percentage of all births reported during the year according to nativity of mother it was found that Irish mothers gave the highest mortality (153), Austro-Hungarian (130), Russian (105), German (100), American (84), and Italian (81) mothers in order named.

Viewed from the point of month of pregnancy, 66 out of the 105, or 63 per cent. reached full term, 9 reached the seventh and eight month, 7 reached the fifth and sixth month, and 23 reached various periods less than the fifth month. Viewed from the point of surgical interference in 58 cases no instruments were used, information was not obtainable in 21 cases, in 10 cases forceps were used, craniotomies were performed in 3 cases, 5 cases were curetted, three pairs of twins were born, 2 cases of ectopic gestation occurred and one had the placenta removed by manual use.

In recent years there is no doubt that the preaching of antiseptic and aseptic precautions has had its effect in reducing the mortality from this cause, but much remains to be done. When we consider that the life of a mother is of the highest value to the community irrespective of the angle of view, then all attendants at confinements should be made to realize the responsibilities imposed upon them as to the prevention of infection in the accouchement. This can only be done first by compulsory notification; the attendant at confinement must be made to realize that the failure to report cases will be followed by legal procedure to punish the offender. There is no professional man as timid as the physician in appearing in court as a defendant; and I know whereof I speak.

The second step should be educational in character; the expectant mother should be advised as to the necessity of cleanliness; proper food, air and sleep should be obtained in order that the body may be able to offer resistance if infection does take place. The physician and the midwife need allopathic doses of cautionary literature on the subject of asepsis at the bedside of a mother to be.

The third step should be official supervision similar to that in use in cases of the better known infectious diseases.

THE PREVENTION OF ODORS AT CITY REFUSE DISPOSAL WORKS.

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Read before the Sanitary Engineering Section, American Public Health Association, Jacksonville, Fla., November 30–December 4, 1914.

THE disposal of city refuse, unless conducted in a proper manner, is apt to cause conditions under which offensive smells or odors are created and maintained. It may be interesting to examine into this fact more closely than has been done heretofore, with the hope that some helpful conclusions may be reached and improved ways and means found to prevent these nuisances.

It may be well first to consider some pertinent fundamental data. Investigations made regarding the sensation of smell, from the highly developed scent of a dog down to our own olfactory nerves, when they are entirely benumbed by a continuous excitation in a room filled with odorous vapors, have thrown some light on the relative physiological facts. From many observations, measurements and studies we can gather some results that are useful for our purpose.

The perception of an odor is caused in man by the stimulation of a small area of mucous membrane or epithelium, less than the size of a cent, near the upper end of the nasal duct. We have the best grounds for believing that the normal excitation of this area is caused by the impingement of molecules of matter, diffused either in solid, colloidal, liquid or gaseous form and not, as has sometimes been suggested, by wave-like vibrations similar to those causing the sensation of sound.

Tyndall proved that air, after it had been in contact with odorous substances and had taken up their vapors, absorbed heat much more readily than did pure air. He found that vapor of the oil of roses absorbed 36 times more heat than pure air. Tigerstedt found that the specific gravity of natural odorous vapors was sufficiently high to cause a distinct measureable retardation in their diffusion. He found also that different vapors have different rates of diffusion, and that odorous vapors attached themselves and are condensed by adsorption at the surfaces of glass, paper, cotton, water, skin and clothing, etc.

Odorous molecules, on the other hand, detach themselves from the surfaces of odorous solids and liquids by simple evaporation, by oxidation and hydrolytic decomposition.

Currents of air will carry vapors, as they carry dust, along with them to quite a distance.

Some scientists have maintained that only gases, and not liquids, were capable of stimulating the olfactories. Others, however, like Johannes P.

Müller, have apparently demonstrated that liquids having odorous matter in solutions did produce odors, such as the solutions of the sulphates of sodium and magnesium. Müller found that some fishes, particularly sharks, have a well-developed sense of smell.

It is well known that we can perceive odors much more readily when the air is moist than when it is dry. It is also known that the mucous membrane in the nasal duct must be moist in order that an odor is perceived. We cannot smell when it is dry nor when the nostrils are completely filled with any liquid, even Eau de Cologne.

Passy made some valuable determinations as to the least amounts of odorous matter that can be perceived by us. He has given figures per liter of air in which the following quantities of certain substances are dissolved and can be perceived:

Camphor	0.005 mg.
Ether	0.004 to 0.0005 mg.
Sulphureted hydrogen	0.0005 mg.
Essence of orange	0.0001 to 0.00005 mg.
Mercaptan	0.00000004 mg.

The great relative intensity of odor that is produced by mercaptan is hereby indicated. No determinations which apply more specifically to city refuse seem to be available.

Different olfactory nerves correspond to the perception of different kinds of odors. Some persons are incapable of perceiving certain odors, as vanilla, violets, certain faintly burning vegetable matters, etc.

All olfactory nerves tire of some odors more or less soon, and after a certain time, fail to respond. While in this condition they can at once perceive the sudden appearance of other odors. For instance, Aronson found that persons having become insensible to the odor of iodine from continuous use, found their perception of the odor of ether at once perfect.

It is also known, if we may add another interesting physiological case, given by Nagel, that two or more entirely different odors may cause a composite odor not resembling any one of the original odors. Nagel also found that some odors compensate each other more or less. For instance, 4 grams of iodoform are made almost inodorous by 200 milligrams of Peru balsam. The cause is not a chemical one, because the same result is found when the two substances are separately introduced into the two nostrils, as reported by Zwaardemaker. The odor of paraffine introduced into one nostril will neutralize the odor of rubber, when introduced into the other, in a certain proportion.

City refuse when delivered at the disposal plant may cause, in its raw state, offensive odors, chiefly after the beginning of the putrefaction of some of its parts. The odors to be discussed in this paper relate only to those which are associated with the final disposal of refuse. They can be suppressed at once by subjecting the refuse on arrival to a proper treatment by any of the well-established methods.

The different parts of a city's refuse are enumerated as follows: Garbage, dead animals, night soil, stable manure, street sweepings, ashes and rubbish.

All of these parts can be treated and finally disposed of by incineration. Garbage and dead animals can be treated by their reduction to grease and fertilizer. Or, garbage, dead animals, night soil and manure, can be buried as a final disposition. Manure, street sweepings, ashes and rubbish can sometimes be satisfactorily disposed of by dumping, and fresh garbage as food for pigs.

The odors which may arise in connection with these various methods of treatment may be classed in two groups.

First.—Odors from the escape of pure gases which are soon converted into other gases that are not offensive. For instance, sulphureted hydrogen persists in an offensive condition so long as it is concentrated or not decomposed, but when diluted in a sufficient quantity of air it is altered into other and inoffensive compounds.

The general remedy for eliminating such odors, therefore, is either the discharge of the gases into an air current sufficiently great to get a quick dispersion and dilution, or the passage through a medium which produces a chemical destruction by fire, or through a disinfecting chamber, or by a dispersion into and a dilution by a sufficiently ample current of water. A disappearance of odorous gases by dilution in the atmosphere is generally quite rapid.

Second.—Odors from vapors, which are the forms of substances which normally exist either as gases or liquids, and which, in the case of an incinerator, are frequently accompanied by extremely minute particles of solid matter or dust. For instance, we may refer to the odors from the vapors and dust particles which arise from a chimney and persist until they can be sufficiently diluted and the odor from them has become unnoticeable. Their disappearance by decomposition in the atmosphere, if it takes place at all, is extremely slow.

The remedy is substantially as above, namely, a quick discharge and dispersion in a sufficiently large air current, if in an open country, or a passage through fire or through a disinfecting air chamber, or by dispersion and dilution in a sufficiently large current of water.

For the prevention of odors it is of first importance that all solids or liquids causing them are collected as quickly and as thoroughly as is financially practicable. It is further important that the odorous gases or vapors are removed by natural or artificial ventilation, with the aid of furnace heat, blowers or air jets, or by a discharge into the atmosphere in a manner to effect a thorough dispersion sufficient and dilution.

Ordinary ventilation does not remove the vapors which are held at solid surfaces by adsorption. A jet of compressed air frequently played against the interior surfaces of the buildings and against the clothing of attendants, will remove this source of odor. Odorous solids and liquids, from which the molecules carrying the odor are detached and rise up into the air, should not be long exposed about the works.

Special care should be taken, when the atmosphere is moist and warm, to suppress the odors about the works, because under this condition our olfactories are most sensitive to odors.

The tiring of the sensation of smell when continually active, forms some excuse for neglecting to keep the plants wholly inoffensive. It would be well, therefore, to establish reasonable rules, so as to control the suppression of odors and to enforce the rules even if men about the plants do not feel the necessity therefor.

It is most convenient now to discuss the odors as they relate to each of the above enumerated parts of a city's refuse, and in doing this I shall adopt the reverse order which was given above.

1. *Feeding* garbage to pigs should be prohibited unless the garbage is delivered fairly fresh and without offensive odors. No decomposition sufficient to produce putrefaction of any part of the garbage should be allowed to have taken place. Slight odors of kitchen waste, such as we perceive at the collection can, are neither injurious nor objectionable, nor can there be objection to the odors of the first decomposition perceived when parts of the garbage have turned sour. Unless fed before putrefaction has begun garbage should be disposed of in other ways.

2. *Dumping.* In order to discuss odors arising from the dumping of stable manure, street sweepings and ashes, we should discriminate between the several parts.

Stable manure, if put on fields and utilized or dumped on vacant grounds, may cause the familiar odor which according to the locality may or may not be objectionable. In the former case dumping should not be continued and old manure dumps should be completely covered with a few inches of ashes or earth.

Street sweepings, if dumped on vacant ground, should also be treated in this manner, although the odors are generally not objectionable.

Ashes do not have offensive odors, but cause objection only from the dust which is raised by dumping and by winds.

3. *Burial* of garbage, dead animals, night soil and manure, is an efficient method of at once preventing all offensive odors. It is the oldest and most common method used for disposing of all such organic waste matter which cannot be more profitably treated in other ways.

4. *Reduction* of garbage and dead animals is practised in many large cities of our country. Of all the treatments this one has produced the most objectionable odors, although it is neither difficult nor very expensive to prevent them.

These objectionable odors are due partly to the delivered garbage when it is temporarily stored at the plant until treated, partly to the fumes produced during the treatment, partly to the exposed tankage and partly to the exposed liquids discharged from the digesters and grease separating tanks.

To prevent the creation and maintenance of these objectionable odors, the works should first be kept scrupulously clean. The operation should then be so arranged that the freshly delivered garbage can be placed into the digesters within a very short time and best at once, and not be exposed in the open until it gets foul.

The gases and vapors arising in an ascending air current from the digesters, as well as from the presses, naphtha tanks, and wherever odors from the cooked garbage may be generated, should be caught in hoods closely placed, of sufficient size and proper shape, and discharging into pipes of diameters properly proportioned to carry away the respective amounts of odorous air ascending from each hood. The draft into the hoods and the circulation in the pipes is best effected by a blower of ample capacity.

The odorous air thus collected from all places where it is formed should be delivered at the best place for treatment. This place is generally below the grates of the furnaces connected with the operation of the works, where it can be passed through the fires by forced draft and be thoroughly purified by intense heat. If the quantity of this air is too great for serving the regular furnaces, an additional special furnace may be built to cremate the excess in quantity, as the complete destruction of the causes of this offensive odor is important. Or, the objectionable air may be discharged into the rear pass of the boilers which may sufficiently eliminate the odors. Practically all of the objections that have been made to the installation of garbage reduction works has been caused by the foul odors frequently emanating from them.

Another method of purifying this odorous air is by passing it through a disinfecting chamber, which method, however, is generally less efficient and more costly.

A noticeable improvement is often gained by making use of a compressed air jet to occasionally aërate the interior walls of the building in which garbage reduction is effected and the surfaces of all apparatus within the same and even the clothing of the attendants, which has been known to retain the odor for hours.

The foul liquids from such plants should at once be discharged into and carried away by a sewer pipe and disposed of as sewage.

5. *Incineration* can dispose of all classes of city refuse without exception. It is a method by which all classes when thoroughly mixed can have the odors of all parts completely destroyed which may otherwise create a nuisance.

To accomplish this end, it is necessary to incinerate the refuse at a high temperature, nominally at least 1250° F., so as to guarantee the sufficient combustion of all organic matter and thereby to remove all sources of odor. Burning at a low temperature is apt to leave some of the organic matter only partly destroyed, and in this incompletely destroyed condition some of it emits a strong pungent odor.

To guarantee the prevention of a nuisance from refuse incinerators it is, therefore, necessary to have high temperature furnaces, which allow of the escape from the stack of chiefly carbon dioxide, if the combustion is complete, and monoxide if it is less so, but sufficient to prevent offense.

When the combustion is perfect there is no visible discharge from the stack. When smoke is seen to escape, it furnishes evidence that unburnt matter may also be discharged. Most of this matter will be organic, because of its lightness, and it is probable that it will have an offensive odor which can be perceived where the fumes strike the ground or a window. This fact has caused frequent complaints to be lodged from inhabited houses to which these fumes had drifted. Minute and even invisible particles of solid and partly burnt organic matter are not quickly dissolved and decomposed in the air, as is the case with gases. They drift and may travel a long distance as invisible clouds.

A pungent burnt garbage odor was recognized by myself on one occasion at a distance of over a mile from the stack discharging objectionable smoke, with a very faint wind blowing from the stack to the point of observation.

In order to successfully incinerate refuse in high temperature furnaces, so that no odorous smoke will escape, it is necessary to use forced draft and to carefully and intelligently regulate the fires and drafts so that the combustion is at all times perfect.

To prevent odors about the plant, no garbage should be stored longer than a day before it is incinerated, although an offense from mixed refuse does not arise as soon as from garbage alone as generally delivered at a reduction plant. It is further generally wise to arrange hoods and ventilating pipes in the furnace building to receive and carry the air, which may have become somewhat foul from contact with the refuse, to below the furnace grates and used with forced draft, so that the intense heat of the fire will thoroughly purify it.

As at reduction works it is advisable to keep incinerating works scrupulously clean. No refuse should be left scattered about. Dust from the final clinker and ashes should be properly controlled, and the floors of the buildings should be swept or washed daily. The walls of the buildings, the tools, clothing, etc., should be given, as often as found desirable, a blast from nozzles supplied with compressed air.

Attention to the above mentioned facts and to the conclusions drawn therefrom may prevent all offensive odors at refuse works, whichever of the best methods of disposal may be employed.

EDUCATIONAL WORK IN SANITARY FOOD VALUES IN NEW YORK CITY.

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Read before the General Sessions, American Public Health Association, Jacksonville, Fla., November 30–December 4, 1914.

THE necessity for rational educational work in connection with the so-called "pure food campaign" has been only too apparent. A knowledge of the facts regarding pure food would have made more easily possible the establishment of reasonable standards and would have prevented the unfortunate confusion of economic factors with factors of real health significance.

In any event the emphasis from now on in food work is likely to be of a slightly different character for in contrast to the past few years we are now expanding into a campaign for *clean* food. In the clean food campaign there are several things to be realized at the start:

1. Clean food as a factor in the prevention of disease transmission is of immensely greater importance than is "pure food."

2. The necessity for well founded educational work is equally if not more apparent than in the pure food campaign.

3. In clean food work there are two big elements from the point of view of justification that are worthy of separate emphasis, namely, the sanitary on the one hand and the economic on the other. We must realize further that another subdivision is necessary in the sanitary field for we must recognize here, as in all health work, the frequently different demands of decency and of health.

4. In clean food again there are several points of attack beginning with food production and including the transportation, the storage, the wholesale handling and finally, the retail distribution of food. Obviously education and control is needed everywhere. It is probably true that in the questions of transportation and storage the economy factor is of decidedly greater importance than is the health factor. This may be true also in the field of retail distribution but the difference is less for here more than anywhere else in the food world must serious consideration be given to the sanitation of food handling.

5. It is in the field of retail distribution that the greatest amount of popular educative work is needed. It is here also that the greatest number can be reached. In this field the educational work comes, so to speak, closest home.

6. There are then, in clean food work, two main classes to be reached, namely, the housekeeper and the small retail food distributor.

In most communities educational work has been carried on for a long time, both intensive and extensive in character, by many private organizations such as the Consumer's Leagues, the Woman's Municipal Leagues, the Housewives' Leagues, etc. This work has been very admirably conducted and a great deal has been accomplished especially so far as the control of the home and the purchaser is concerned. It may be said that until recently almost all of the popular educational work in many cities along health lines has been carried on by outside unofficial agencies. In food work, for instance, many Health Departments until recently, have been satisfied with a series of not especially instructive visits to the food shops, followed by prosecutions and fines, and it was not a great while ago that a prominent Health Department official boasted of the fact that twelve million pounds of food had been destroyed in one year by the Department inspectors.

Recently, however, things have taken a decided turn for the better, a constructive educational point of view has been adopted, a strenuous effort is being made by preventive measures to eliminate this tremendous waste of food, and in fact, fortunately for city food supplies the departments of health are inculcating in their food work an increasing amount of prophylactic educational endeavor.

During the winter of 1913–1914, the Bureau of Food Supply of the New York Association for Improving the Condition of the Poor selected an East Side district in Manhattan Borough stretching from 59th to 79th Streets and from Third Avenue east to the river, and made in that section an intensive study of all types of food shops—butcher, bakery, grocer, delicatessen, fish market, push cart, candy store, restaurant, etc.—in order to discover accurately the conditions prevailing regarding equipment and food, the knowledge of food handling and of the food law possessed by the small shop men, the number and kind of violations and practical methods of preventing the same, the efficacy of the municipal inspection system and the relative value of intelligent educational methods, etc.

This study was carried on in closest coöperation with the Department of Health, a special inspector from the Department accompanying the investigator from the Bureau of Food Supply. Violations were reported to the Health Department, and instructions given regarding the cheapest and safest methods of obeying the law and the sanitary and economic reasons for doing so. Second and third visits were frequently necessary to determine the effect of the instructive method.

The study showed in the first place a decided willingness on the part of the small storekeeper to clean up his shop if he were only told how and why. The conclusions of the investigation were of course presented to the Department and somewhat on a basis of the data and experience thus acquired an attempt has been made to discover the most effective methods of placing the most useful knowledge regarding clean food into the hands of the greatest number of people. The Department of Health through its Bureau of Publicity and Education and its Bureau of Food Inspection has taken the lead in this matter. While this type of educational work has really just begun it is felt that a fairly good start has been made and it may be worth while to outline briefly a few of the educational methods adopted.

A. A Clean Food Exhibit.

Section 46 of the Sanitary Code reads as follows:

"No food, except fruits and vegetables that are peeled, pared or cooked before consumption shall be kept, sold or offered for sale or be displayed or transported unless protected from dust, dirt, flies or other contamination. The term 'food' as herein used shall include every article of food and every beverage used by man, and all confectionery."

This, of course, applies to push carts, candy stands, grocery stores, fish markets, and all other retail food distributing centres. As most of these small dealers are by no means prosperous it was thought worth while to demonstrate to them not only the approved methods, from a sanitary standpoint, of covering and screening foods and of protecting them from dust, dirt, flies and handling, but also the cheapest satisfactory way. Consequently an exhibit was prepared and set up in the Health Department building consisting of a model push cart, a proper case for the display of sliced fruits, bakery and grocery show cases, berry boxes, street candy baskets, sanitary pickle jars, etc. It is planned to bring to the exhibit from time to time through the medium of the Retail Dealers Associations, groups of food distributors and it is hoped that the exhibit may be moved about from place to place. Undoubtedly such an educational demonstration will prove to be worth a great deal more than the previous system of prosecutions and fines and food condemnations.

B. An Itinerant Push Cart.

In food distribution in New York City the push cart is an exceedingly important factor, consequently there is a vital necessity for economic and sanitary control over this medium. In the Borough of Manhattan, President Marks has proceeded to establish the push cart on a sounder sanitary basis through the creation of push cart districts, special push cart streets, etc., and from the sanitary side some control is had over the push cart man himself through the system of licensing. Obviously the most urgent necessity was that of controlling and protecting the food itself and for carrying on educational work in this field a properly though cheaply constructed and equipped model push cart was prepared. This was supplied with fruit, candies, etc., and was pushed about the streets bearing a sign which showed that the cart was one which met the approval of the Department and was the type which the Department in the future would require. All of it, properly ventilated, was covered with glass and made perfectly fly-proof, boxes being attached for carrying wrapping material and for receiving waste, etc. This supplemented the push cart on exhibition at the Department of Health and greatly assisted the Department in raising, by intelligent methods, the standard of push cart food control.

C. An Educational Food Leaflet.

Such a leaflet was prepared and was distributed by the Health Department visitors, the Bureau of Food Supply investigators, private philanthropic associations, settlements, neighborhood associations, etc. An effort was made to get the leaflet, accompanied by an intelligent explanation, into the hands of each storekeeper. The leaflet was illustrated by contrast pictures and emphasized the following points of view:

1. What the Health Department requires of the shopkeeper.
2. What foods the Sanitary Code applies to.
3. The cheap and safe ways of meeting these requirements.
4. The health reasons for cleaning up.
5. The decency reasons for cleaning up.
6. The economic reasons for cleaning up.
7. What the small dealer should expect from the Department of Health.
8. An invitation to visit the Department of Health clean food exhibit.

D. THE USE OF THE REGULAR DEPARTMENT BULLETINS.

The weekly bulletin of the Department, having a circulation of 10,000 and going to all physicians and many private associations, etc. was supplied with a short, direct, concise paragraph on a particular phase of the food question. An attempt was made to reach the retailer through this special class of consumers while the material was presented in a popular form so as to obtain through the use of it by the press from the bulletin proof as wide a popular distribution as possible. Typical of these special food inserts are the following:

CLEAN FOOD AND DECENCY.

Dirty food is food covered with *dust*, food to which *flies* have carried dirt and disease germs and food that everyone with *hands unwashed*, is permitted to handle.

You may get disease—typhoid fever and tuberculosis—this way, but even if you escape that, do you want to eat fruit covered with a fine dusting of horse manure, or meat upon which flies, probably from a nearby garbage pail have feasted?

Decency is worth while and does not cost very much—you can get it, too, in your shops, if you help the Department of Health to enforce the law regarding the screening and covering of foods by suggesting to your dealer that he *clean up*.

DIRTY FOOD AND DISEASE.

When cooking in your home, when buying in the shops, remember the serious results that may follow the interaction of the "five dangerous F's"

Filth
Food
Fingers
Flies
Fever

In the disunion of these forces there is health and strength for the consumer.

Insist that your butcher and your grocer overthrow in his shop, by screening and protecting his foods as required by law, the reigning dynasty of the "five deadly D's"

Dirt
Dinner
Disease
Diarrhea
Death

Other than these joint activities the Bureau of Food Supply itself has taken advantage of a great opportunity for educational work in connection with the food supply store which is operated in the previously mentioned East Side district. This is a plant established primarily as a distributing center for the food which goes to the families under the care of the Family Welfare Department of the Association. While some educational work has been carried on in this connection it is planned in a short while to increase this considerably. In connection with this food store it will be possible to make effective educational influences the more important of which may be briefly outlined as follows:

1. The store itself will be maintained as a model plant from the economic and sanitary points of view of food protection and will thus serve as a demonstration to the neighborhood.

2. Educational material may be distributed from time to time to the people who shall be served by the store as consumers.

3. An educational system may eventually be provided in which instruction may be given to the food consumers, mothers, school children, etc., on the economic, sanitary, dietary and culinary phases of food preparation and handling.

4. As the Bureau of Food Supply is particularly familiar with the defects and needs of the East Side district in the center of which the present food store now exists, every effort is being made to follow up in that district the effects of the previously described investigation and campaign.

It is planned in the future, either independently, or in coöperation with the Department of Health to publish and distribute a series of leaflets on such subjects as "The Pure Food Law," "The Sanitary Code and Clean Food," "A Clean Food Store Pays," "The Why and How of Clean Milk Distributing," etc.

The Bureau of Food Supply recognizes also the necessity of a more practical interpretation of food values on a basis of our present knowledge of dietetics. In order that this knowledge may be made available for the average consumer and housekeeper a study is being made at the present time in coöperation with the Department of Chemistry of Columbia University, the purpose of which is to ascertain whether a modernized dietary standard can be translated into a simple food budget, the use of which will not require scientific training, nor technical knowledge of food values.

It is realized that the most effective place to lay the foundation for rational food values is in the minds of the children. Consequently, the Bureau of Food Supply in coöperation with the Department of Education has organized a series of lectures for this winter which are being given to the elementary and high school pupils and which emphasize not only the sanitary and economic features of food control but give practical instructions in dietetics and the culinary art. Practical demonstrations regarding the dietary and caloric features of the food question are being given by means of model meal exhibits in connection with several lunch services in industrial and business institutions and a plan for similar educational work has been presented to the Department of Health for use in its proposed lunch room and in the new Municipal Building lunch service. The Department of Social Welfare through another of its Bureaus, namely, the Bureau of Welfare of School Children, has seized another good opportunity for educating the school children by tying up with the school lunch service which this Bureau now operates in 28 elementary and high schools a system of practical instruction not only regarding the use of food in cooking but the proper methods of making food purchases in the stores, etc.

All of us must realize that if health appropriations for this type of work are to increase, the people must be intelligently informed of the true, comparative values of these health measures. In health work, in clean food work as everywhere else, education is the essential prerequisite to sound judgment concerning relative health values.

Book Review.

The Nervous System and its Conservation. *By Percy Golthwaite Stiles. Philadelphia and London, W. B. Saunders Co., 1914. Pp. 229. $1.25*

This most interesting and clearly written volume is an attempt to apply the fundamental facts of the anatomy and physiology of the nervous system to the explanation of many events of daily life, thereby bringing out more clearly the physiologic basis of the hygiene of the nervous system. The writer has been for many years a teacher of personal hygiene as well as of physiology and the reader readily sees that he has studied each of these sciences with the other constantly in mind. The book he has given us is therefore most useful both to students of physiology and to students of personal hygiene. Every year sees the facts of physiology brought into closer relation with the experiences of daily life and it is most helpful to the student of the science, even to the student of the elements of the science, to read a book like this which is constantly pointing out the applications of physiology; no less helpful is it to the student of personal hygiene to have emphasized the physiologic basis of the solution of his problems.

The book is interesting and suggestive to all students of the subject; it will find its greatest usefulness among those who are not specialists in physiology, neurology, or psychiatry, but whose work must reckon more or less with each of these sciences. The general practitioner will be abundantly rewarded by finding new points of view; students of education need just the clear comprehension of the facts presented which they will obtain from its perusal. Finally it is a book for the general reader; no one need fear getting lost in the maze of nerve terminology or from the constant employment of concepts familiar only to the specialist. Language could not be simpler nor exposition more lucid. It is interesting and entertaining at the same time that it is soundly scientific in its point of view; and not the least of its merits is that it does not "dictate in a dogmatic spirit" but rather opens "important matters to fuller discussion."

Theodore Hough,
University of Virginia.

NOTES ON THE PRACTICAL APPLICATION OF THE "SALTPETER METHOD" FOR DETERMINING THE STRENGTH OF SEWAGES.

ARTHUR LEDERER,
Chemist and Bacteriologist, The Sanitary District of Chicago.

Read before the Laboratory Section, American Public Health Association, Jacksonville, Fla., December, 1914.

Since the publication of the saltpeter method of determining the biochemical oxygen demand of sewages and polluted waters* I have made a number of observations which throw more light on the reliability and practicability of the method. I have also simplified the procedure so as to make it more adaptable to working conditions. At the present time the operation of the sewage testing stations of the Sanitary District is entirely controlled by this method. It has also been employed in sanitary surveys of polluted streams.

The method is based upon the biochemical consumption of saltpeter oxygen by a sewage during an incubation period of ten days at 20° C. The initial minus the residual available oxygen expressed as parts per million oxygen indicates the biochemical oxygen demand. The original procedure consisted in the addition of varying quantities of saltpeter to the sewage in stoppered bottles, either with or without the addition of methylene blue. If no coloring matter was present, the "septization" of the sediment served as the index of the oxidation. The residual nitrite-nitrate oxygen was determined in the bottle in which the sediment did not turn septic after ten days' incubation. This method of employing varying quantities of saltpeter is necessary of course in preliminary tests when one deals with a sewage of unknown strength. There is, however, no additional labor involved, since only one bottle is selected for the final analysis. The other bottles are discarded. Once the approximate maximum strength of a certain sewage is established, a definite excess of saltpeter can be employed, thus reducing the number of bottles to one. I have found on various occasions that a reasonable excess of saltpeter does not result in an increased oxygen consumption. In this respect the method is vastly superior to all of the methods involving fresh water dilutions, such as required in the Modified English Incubation Test, accepted as a provisional procedure for the "Standard Methods of Water Analysis." It is true that in any dilution method, only free oxygen determinations are required which are much simpler than nitrate-nitrite determinations, from the analytical standpoint. However, the precautions and amount of preliminary work required in a dilution test such as the English Incubation

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*Lederer, J. Infect. Dis., Vol. 14, p. 482.

Test* are great and emphasize the difficulties of obtaining comparable results with such a test.

In order to have comparable results with the English Incubation Test, it is absolutely essential to prepare a dilution which is just sufficient to insure stability. The saltpeter method was originally developed on this basis. Various dilutions were made of the sewage with fresh water and methylene blue was added as an indicator. The dilution, just sufficient to retain the color, expressed in parts per million of oxygen, gave the same result as when an equivalent of saltpeter of oxygen was added to the undiluted sewage. The saltpeter solution was prepared on the basis of five oxygen atoms being released from two sodium nitrate molecules. It is obviously wrong to prepare *ad libitum* any kind of sewage-water mixture and compare the free-oxygen consumption thus obtained with the saltpeter-oxygen consumption. Matters are still worse if a dilution is incubated at one temperature and the saltpeter sewage at another. An intelligent comparison can only be drawn by adhering to the procedure indicated above. That a serious error can occur in comparing the free-oxygen consumption with the saltpeter-oxygen consumption, if the proper required concentration is not adhered to, was impressed on me during the coöperative work on the Modified English Incubation Test. In a number of the series of experiments I worked out the saltpeter-oxygen consumptions, as well as the free-oxygen consumptions in the various concentrations. Such a comparison is recorded in the following Table I, the results being expressed in parts per million.

The figures in parenthesis indicate the percentage of oxygen absorbed by the sewage after ten days' incubation. The influence of concentration upon oxygen absorption is strikingly illustrated in the table. However, when the per cent. of oxygen absorbed by the sewage approaches 50 or thereabouts the two absorption figures do not differ very greatly, making allowance for unavoidable working errors in either method.

One difficulty encountered by the sub-committee on the determination of the biochemical oxygen demand of the laboratory section of the American Public Health Association was the fluctuation of the oxygen content during the incubation of a sewage-water mixture from one day to the other. Such fluctuations have been noted by nearly all of the co-workers, and account for the unreliability of the method. The reasons for these irregularities has not been satisfactorily explained, but it is probably that the re-aëration through loose stoppers is only a minor factor. Nevertheless, mixtures in which the free-oxygen is measured after incubation must be guarded from contact with the air. Re-aëration constitutes an almost negligible source of error in the saltpeter method. A number of experiments have been

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* Lederer, J. Ind. Eng. Chem., Vol. 6, Nov., 1914.

TABLE I.

FREE-OXYGEN CONSUMPTIONS IN VARIOUS CONCENTRATIONS COMPARED TO SALTPETER-OXYGEN CONSUMPTIONS AT 20° C.

Serial number.	Time of incubation in days.	Fresh water oxygen demand, P. P. M.							Saltpeter oxygen demand P. P. M.
		Original concentration of sewage in per cent.							
		1.0	1.5	2.0	2.5	3.0	4.0	5.0	
1	1	60	27			20			38
	5	180	113			97			71
	10	230	146			120			81
		(26)	(26)			(43)			
2	1	50	33			33			18
	5	130	100			67			57
	10	180	126			90			81
		(20)	(22)			(31)			
3	1	20		15			20		19
	5	150		90			75		78
	10	190		135			92		86
		(22)		(32)			(44)		
4	1	50		40			32		—
	5	140		95			75		63
	10	210		135			98		80
		(24)		(31)			(45)		
5	1	50			32			22	32
	5	110			84			66	66
	10	120			92			88	75
		(14)			(27)			(53)	
6	1	30			24			22	30
	5	100			68			64	60
	10	140			100			—	71
		(16)			(30)				
7	1	70			32			32	24
	5	150			96			60	52
	10	180			104			76	66
		(20)			(30)			(45)	
8	1	50			28			26	23
	5	130			96			80	66
	10	150			116			98	78
		(17)			(34)			(58)	
9	1	70			36			36	27
	5	190			112			100	67
	10	240			124			108	89
		(28)			(36)			(65)	

carried on incubating sewages with various stoppers, one seal,* and without a stopper at 20° C. and 37° C. The results are recorded in the following Table II:

TABLE II.

INFLUENCE OF EXPOSURE TO AIR UPON THE RESULTS OBTAINED BY THE SALTPETER METHOD.

Serial number.	Bio-chemical oxygen demand, P. P. M.									
	Incubation at 20° C.					Incubation at 37° C.				
	Number of days.	Glass stopper.	Cork stopper.	Bunsen seal.	Open bottle.	Number of days.	Glass stopper.	Cork stopper.	Bunsen seal.	Open bottle.
1	9	94	94	94	85	5	94	96	93	86
2						5	121	118	115	97
3	11	192	194	191	185	4	166	160	163	147
4	11	178	179	177	168	4	140	140	140	123
5	11	190	192	191	185	4	168	170	170	160
6	12	790	816	787	777	6	782	753	753	620

This table shows clearly that the precautions against re-aëration in the saltpeter method need by no means be rigid. A seal is not required, in spite of the appreciable quantity of gas accumulating beneath the stopper during incubation. Any kind of a stopper will do, even though the incubation be carried on at 37° C.

I wish to correct a statement made in the original article concerning the amount of free-ammonia formed during the nitrate reduction process. A number of observers, cited in the original article, assumed on the basis of experimental data that no free-ammonia is formed. Since this point has no actual bearing upon the availability of the oxygen present, it was not reinvestigated by me at that time. Mr. C. B. Hoover of Columbus, Ohio, found that free-ammonia is formed (not published), and this has since been substantiated by me in a number of experiments. Table III will show the results obtained.

The increase of free-ammonia appears appreciable.

Since the absorption of oxygen from the air in the saltpeter method seemed to be a negligible factor, it appeared likely that no error was introduced by incubating a large number of samples collected at frequent intervals and by mixing these individual samples after incubation. This would

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* Bachmann, J. Ind. Eng. Chem., Vol. 6, Sept., 1914, p. 764.

TABLE III.

FORMATION OF FREE-AMMONIA DURING SALTPETER-OXYGEN CONSUMPTION.

Serial No.	Temperature of incubation, deg. C.	Time of incubation in days.	Free-ammonia in P. P. M. as N.	
			Before incubation,	After incubation.
1	37	3	7.2	9.2
2	37	3	8.8	12.4
3	37	3	12.4	14.4
4	20	5	7.2	10.0
5	20	5	8.8	11.6
6	20	5	12.4	12.8
7	37	3	10.8	15.2
8	37	3	14.0	16.4
9	37	3	12.0	14.8
10	20	5	10.8	15.2
11	20	5	14.0	18.0
12	20	5	12.0	17.6

furnish a much better control of a sewage disposal plant, giving more precise information on the actual strength of a sewage or tank effluent than other available methods. The solution of this question hinged on whether, in mixing the samples, the nitrites would be oxidized, thus resulting in lower oxygen demand figures. A large number of samples were, therefore, incubated with saltpeter. At the end of the incubation period the bottles were opened and air passed through the liquid for ten minutes. Such a procedure would at once spoil any result based upon free oxygen consumptions. As a matter of fact, it did not alter the result of the saltpeter method at all. The quantities of free-ammonia, nitrites and nitrates were unchanged by the aëration. Composites, therefore, can be made from samples taken at frequent intervals. Large quantities of sewage may be collected in jugs or bottles, containing a sufficient excess of saltpeter, and the oxygen demand may be determined. The larger the size and number of samples, the closer the true figures can be obtained.

The next question of interest concerns the correctness of figures obtained by incubating at 37° C., instead of 20° C. While doubtless it is inconvenient to wait ten days for a result in the operation of a plant or in any particular investigation, it is often advisable to sacrifice accuracy to convenience, providing comparable figures can be obtained. The conclusions to be drawn from the following table should not be generalized. Each operator or laboratory should obtain his or its own temperature relation. It is probable that the relation in different places will not vary greatly with domestic sewages. When working with an unknown sewage or trade-waste, accurate figures can only be obtained by incubating at 20° C. for ten days, this consumption representing between 90 and 100 per cent. of the total. The following Table IV will show the relation obtained by me:

TABLE IV.

SALTPETER OXYGEN DEMAND OF SEWAGES AT 20° C. AND 37° C.

Serial No.	37° C.		20° C.		Serial No.	37° C.		20° C.	
	Incubation in days.	Oxygen demand P. P. M.	Incubation in days.	Oxygen demand P. P. M.		Incubation in days.	Oxygen demand P. P. M.	Incubation in days.	Oxygen demand P. P. M.
1	5	180	10	198	17	6	130	10	126
2	5	124	10	133	18	6	129	10	107
3	5	162	10	171	19	6	102	10	102
4	5	165	10	178	20	6	174	10	156
5	5	184	10	191	21	6	142	10	138
6	5	190	10	198	22	6	128	10	102
7	5	107	10	107	23	6	247	10	241
8	5	150	10	165	24	6	127	10	132
9	5	190	10	198	25	6	148	10	158
10	5	190	10	188	26	6	244	10	246
11	5	176	10	185	27	6	157	10	148
12	5	112	10	125	28	6	189	10	180
13	5	149	10	160	29	6	134	10	132
14	5	189	10	191	30	6	79	10	81
15	5	134	10	142	31	6	120	10	122
16	5	156	10	167	32	6	177	10	170
Average		160		168			152		146

According to this table, no appreciable error is introduced by incubating the samples for five or six days at 37° C. instead of 10 days at 20° C. The figures for the five- and six-day incubations are both within 5 per cent. of the 20° C. figures. A maximum of 5 per cent. has been found to be the approximate working error of the method. After the fifth day of incubation at 37° C., the absorption of oxygen is very slight. I, therefore, resort to five-day incubations at 37° C. for rapid work with my particular sewage. The cut can be made shorter by ascertaining a rough relation between the first day and tenth day incubation figure. Personally, I do not advise such a short incubation period, on account of a possibility of serious error. In eight tests which I made, the one-day incubation at 20°

C. was approximately 33 per cent. of the ten-day figure. The figures fluctuated between 22 and 43 per cent., showing the inaccuracies of an extremely short incubation period. Very often it is highly desirable to obtain information on the twenty-four-hour and ten-day oxygen absorption as well, where this relation gives a clue to the deoxygenating quality of a sewage during the first stretch after discharge into a river.

The nitrate reduction does not seem to be influenced by the artificial addition of many common bacterial species ordinarily found in water and sewage. This was found true with B. fluorescens liquefaciens. B. acidi lactici, B. megatherium, B. subtilis, Str. pyogenes, B. enteritidis, B. lactis aerogenes, B. coli, B. cloaceae, B. vulgatus, and B. prodigiosus.

A word of caution is required to prevent the indiscriminate application of the method to tradewastes. All of the original observations have been made on domestic sewage and polluted river waters. The enormous variation in the character of tradewastes makes it impossible to recommend the method unqualifiedly without preliminary tests. My experience with the application of this method to tradewastes relates, so far, only to slaughtering housewaste, on which it is working very satisfactorily. A tradewaste should be alkaline and should contain bacteria, or this method is not applicable. An acid tradewaste or too alkaline a waste should not be taken without adjusting the reaction to a slightly alkaline. If sterile, the contents should be contaiminated artificially with sewage. Even this may not prove sufficient.

The residual nitrate-nitrite should be carefully determined to avoid the liability to error in making readings, due to the large dilutions required for the colorimetric determinations. The error in reading ought not exceed 5 per cent.

Lately I have carried on some work on the method discussed in this paper, employing, however, a sodium nitrite instead of sodium nitrate solution. The quantities employed are calculated, of course, on the availability of oxygen, five oxygen atoms being available from two saltpeter molecules and three oxygen atoms from two sodium nitrite molecules. The intention was to eliminate one determination at the end of the incubation, since only nitrites would have to be determined and not nitrates as well. A considerable number of results seems to indicate that an equivalent of sodium nitrite will give results such as are obtained by using saltpeter, but I withhold a definite opinion until I have investigated further.

The method in its present form should be applied as follows:

For Sewages: The initial available oxygen can ordinarily be disregarded, since it is very small compared with the total biochemical oxygen demand. The maximum oxygen consumption, once established by preliminary tests, may serve as a guide for future tests on that particular sewage. A solution of 26.56 grams of sodium nitrate, c.p., per liter should be employed. One c.c. of this solution in 250 c.c. sewage represents 50 p.p.m. of oxygen. The strength of the saltpeter solution may be varied to suit conditions. Incubate the sewage containing the saltpeter for ten days at 20° C. If 37° C. incubation is chosen, determine the relation of this incubation to that of 20° C. A seal is not required during the incubations. Composites may be made at the end of the incubation from samples taken at close time intervals. The appearance of a black sediment and the development of a putrid odor during incubation indicates that too little saltpeter oxygen has been added. Methylene blue may be added at the start to serve as an indicator during the incubations with saltpeter. Decolorization indicates the absence of sufficient oxygen. Domestic sewage usually varies in its oxygen demand from 100 to 300 p.p.m. At the end of the incubation determine the residual nitrite and nitrates, the latter by the aluminum reduction method. In order to convert the nitrogen into oxygen equivalents, multiply the nitrite nitrogen by 1.7 and the nitrate oxygen by 2.9. The initial available oxygen minus the residual oxygen gives the biochemical oxygen demand, which should be expressed in p.p.m.

For Tradewastes: Employ the same procedure with larger quantities of saltpeter. The reaction should be slightly alkaline. Acid reaction should be adjusted with sodium bicarbonate, and a too strong alkaline reaction with a weak hydrochloric acid solution. If the liquid is sterile, inoculate it with sewage, after adjusting the reaction. When working with a new waste, obtain checks with the dilution method.

For filter effluents and polluted river waters, this method can be supplanted by obtaining Phelps "relative stabilities" (Methylene Blue Method), provided colloidal matter is absent. The initial available oxygen must be determined analytically. It is best to make up a stock solution of 1,0624 grams of sodium nitrate c.p. to one liter of distilled water. One c.c. of this solution in 250 c.c. liquid represents 2 p.p.m. of oxygen. Unless the river water is badly polluted it is hardly required to add more than 10 p.p.m. of saltpeter oxygen. If the methylene blue is absorbed by the colloidal matter of river waters, correct "relative stabilities" cannot be obtained. Filter effluents are ordinarily sufficiently devoid of colloidal matter, and there is no trouble in obtaining correct "relative stabilities" by the simple addition of methylene blue, followed by incubation at 20° C. for ten or twenty days. In waters carrying clay and other colloidal suspensions, the determination of correct "relative stabilities" necessitates the incubation of two samples, one to determine the residual free oxygen, the other to determine the residual nitrite-nitrate oxygen. This procedure is rather tedious but no substitute can be offered at present.

The analytical work connected with this investigation was carried on by Messrs F. Bachmann, J. T. Meckstroth, and F. L. Wurl, to whom I wish to express my appreciation for their valuable assistance.

MASSACHUSETTS ASSOCIATION OF BOARDS OF HEALTH.

THE January quarterly (and annual) meeting of the Massachusetts Association of Boards of Health was held at the Hotel Brunswick, Boston, Thursday, January 28, 1915, under the presidency of Mr. James C. Coffey of Worcester.

The following named persons were elected to membership: Joseph E. Herrick of the Beverly Board of Health; M. R. Jerome Crowley of the Beverly Board of Health; Cooper Gaw of the New Bedford Board of Health; John Albert Sullivan, M. D., of the Pittsfield Board of Health; E. J. Donoghue, M. D., of the Boston Board of Health; Karl R. Bailey, M. D., of the Boston Board of Health; Joshua Edwards of the Maynard Board of Health; O. S. Fowler of the Maynard Board of Health; Miss Ruth O. Pierson of the Wellesley Board of Health; George E. Emerson, M. D., of the Weymouth Board of Health; William F. Gibbons, D. D. S., of the Clinton Board of Health; Joseph E. Lamoureux of Lowell; James F. Moran of the Clinton Board of Health; Allan J. McLaughlin, M. D., Commissioner of Health of Massachusetts; George E. Howe of the Lancaster Board of Health.

On motion of Dr. George L. Tobey, chairman of the Legislative Committee, it was voted that the committee be authorized to employ legislative counsel for the ensuing year at an expense not to exceed $150.

The Nominating Committee, Dr. Chapin, Dr. Stevens and Dr. MacKnight, presented the following names for officers of the association, and on motion of Dr. L. M. Palmer of Framingham it was voted to authorize the secretary to cast one ballot for election of the list as presented:

President, Dr. M. J. Rosenau of Brookline.

First Vice-President, Prof. George C. Whipple of Cambridge.

Second Vice-President, Dr. L. A. Jones of North Adams.

Secretary, Dr. F. H. Slack of Boston.

Treasurer, Dr. F. G. Curtis of Newton.

Executive Committee (elective members), Dr. A. S. MacKnight of Fall River, Dr. F. S. Mahoney of Boston, Dr. F. H. Thompson of Fitchburg, R. L. Newcomb of Salem, Dr. F. G. Wheatley of North Abington.

Dr. Francis George Curtis, Treasurer, presented his annual report as follows:

REPORT OF THE TREASURER, 1914.

Francis George Curtis, Treasurer, in account with the Massachusetts Association of Boards of Health.

Dr.	
Balance from 1913	$1,545.83
Interest	43.72

Dues, etc., 1913	$33.00
Dues, etc., 1914	440.50
Dues, 1915	3.00
Cash for July meeting	82.50
Total receipts	$2,148.55
Cr.	
American Public Health Association, Journals	$371.89
Arthur T. Lovell, reporting meetings	107.20
Printing, etc., for secretary	104.33
Clerical assistance for secretary	12.00
Printing, etc., Committee on Vital Statistics	15.53
Printing, Committee on Isolation in Certain Diseases	50.50
Printing, new constitutions	35.55
Printing and stationery for treasurer	28.50
Cigars	36.80
Dinners, July meeting	83.75
Sundry cash payments by treasurer	3.00
Total disbursements	$849.05
Balance to 1915	1,299.50
	$2,148.55

In Savings Bank	$1,126.14
In National Bank	121.86
Cash	51.50

Respectfully submitted,
FRANCIS GEORGE CURTIS,
Treasurer.

The report of the treasurer was accepted and placed on file.

The following papers were then read:

"The Control of Venereal Diseases," by Dr. F. H. Baker.

"The Reporting and Control of Venereal Diseases, by Dr. Lewis Chargin.

"Evening Clinics for Syphilis and Gonorrhœa," by Michael M. Davis, Jr.

(These articles and discussions appear elsewhere in this issue of the JOURNAL.)

On motion of Dr. Palmer, it was voted: That the Massachusetts Association of Boards of Health place itself on record as in favor of requiring that venereal diseases be made reportable, and we request that the State Commissioner of Public Health take the proper and necessary steps to have this brought about as soon as practicable.

On motion of Dr. Woods, it was voted: That the chairman appoint a committee of five to act as a committee of this society on venereal diseases and follow whatever suggestions are offered by the society in the line of work.

The chairman announced the following members to serve on this committee: Dr. Frederick H. Baker, Worcester, chairman, Dr. Francis X. Mahoney, Boston, Dr. L. M. Palmer, S. Framingham, Dr. F. G. Curtis, Newton, Dr. F. M. Kennedy, New Bedford.

Convention of Massachusetts Health Officers.

Thursday, April 29, will be a great day for the Health Officers of Massachusetts.

The State Department of Health and the Massachusetts Association of Boards of Health are planning for an all day meeting to be held at Ford Hall in Boston.

The morning session, at 10.30, will be a general meeting open to the public, at which addresses will be made by His Excellency David I. Walsh, Dr. Charles W. Eliot, president emeritus of Harvard University, and Prof. William T. Sedgwick, president of the American Public Health Association, and others. Dr. A. J. McLaughlin, commissioner of health, will preside at this meeting and speak on the "Tuberculosis Situation in Massachusetts." President Eliot will speak on the "Main Points of Attack in a Campaign for Public Health." At this meeting a roll of the cities and towns will be called, and it is hoped that each one will be represented by a delegate.

Following the morning session will come the regular meeting and lunch of the Massachusetts Association of Boards of Health, at which the new president, Dr. Milton J. Rosenau, will preside. This meeting will be addressed by Dr. Eugene R. Kelley, the new director of the division of communicable diseases of the State Department of Health, on the general subject of "The Relation of the State Department to Local Boards of Health."

This will be followed by short addresses by four of the district health officers and four representatives of the local health departments.

At these meetings special emphasis will be given to public health problems of small communities. The morning and afternoon sessions will be open to the public.

Invitations to the lunch will be limited to members of the Massachusetts Association of Boards of Health and to those eligible for membership in this Association.

Health Department Reports and Notes.

REPORTS.

Newport, Rhode Island.

The report of the Board of Health of Newport, although late in appearing, is well prepared and indicative of efficient and progressive work. Contagious disease has been generally held in check satisfactorily although there was an epidemic of scarlet fever early in the year which filled the regular hospital and made it necessary to open an emergency hospital. The typhoid situation was worse than usual as a result of the outbreak among the members of the artillery company who attended the ill-fated encampment at Put-In Bay. Although twenty cases came from this source, there was no spread of the disease in the city.

Medical and dental inspection of schools is one of the strong points of the Board and is apparently carried on according to the latest and most approved standards, although still further improvements are planned. Daily visits by school inspectors to both public and parochial schools are made and all exclusions are followed up by the school nurse. A free dental infirmary is also maintained by the Board of Health.

The report of the milk inspector is of unusual excellence from the standpoint of popular education. Inspection of farms and stores and the collection and analysis of milk are regularly carried out. Conditions are being greatly improved among the producers, but difficulty has been experienced in teaching them to produce a milk which will come within the bacterial standard. Clean floors with open-top milk pails or clean cattle with no arrangement for cooling milk will not produce a bacteriologically clean milk. It is possible that publication of bacterial counts or an occasional prosecution would serve to stimulate the farmers' interest in bacteria.

The report, as far as it goes, is excellent but it might be improved by further systematization and the addition of such features as a financial report, a list of the staff of employees of the Board, and some reference to other phases of work such as sanitary inspection, infant mortality, suppression of insect pests, etc., if any work is done along these lines.

Norristown, Pennsylvania.

Conditions in Norristown are apparently not all that they should be, as far as public health work is concerned. From the annual report of the Board of Health for 1914 we learn that Norristown claims a population of 31,000 but is spending less than eight cents per capita for health. The only paid employee of the Board is Mr. Charles E. White, who serves as secretary of the Board, health officer, and registrar of vital statistics at a salary of seventy dollars per month. We are forced to the conclusion that Mr. White is either a philanthropist or a part-time employee.

The death-rate is given as 12.9, a very creditable figure, although it may be noted that it is based on the deaths for 1914 and the population as estimated for 1915. The contagious disease situation has been somewhat worse than the average. Two hundred and twenty-seven cases of German measles occurring in a space of three months are considerately called a "near-epidemic" and 107 cases of scarlet fever in four months are glossed over in the same way. Abnormally high fatality rates for diphtheria, pneumonia, and tuberculosis indicate incomplete reporting of cases and the Board has asked that the requirements of the state law for the quarantine of the minor contagious diseases be reduced so that people will report them more generally.

In the past, before the installation of the sewer, the houses discharged their waste water into the street gutters, but connection with the sewer is now being required wherever possible and it is hoped that the old insanitary conditions will soon be a thing of the past.

The Board is now at work on an attempt to enforce the cleaning-up of houses and yards and is considering placing a placard bearing the words "Dirty House" on the front door of any house which is not cleaned up on first notice.

The Board has made many unsuccessful attempts to get the Council to provide an isolation hospital but the matter has received no attention. As a result when a case of diphtheria appeared in the Charity Hospital the Board established absolute quarantine on the entire hospital. State Commissioner Dixon interfered with this judgment and the case was isolated on the third floor.

No tabulation of deaths by causes is published. There is no detailed financial statement. Tabulated records of all sorts are conspicuous by their absence. Apparently no work is done by the Board on the inspection of milk and other food supplies, on infant mortality, tuberculosis, medical inspection of schools, etc.

Los Angeles, California.

In a comprehensive and yet concise report for the year ending June 30, 1914, Commissioner L. M. Powers announces the results of a very gratifying year for the city health department. The booklet is profusely illustrated, showing conditions both good and bad, that merit attention. An "organization chart," showing division of authority and the salaries of each of the public servants who are connected with the health department, gives a very interesting view of the organization and scope of the department as well as the relative cost to the city of each of its branches or subdivisions. The chief divisions immediately under the commissioner of health are: Nursing; school inspection; laboratories; fruit and vegetable inspection; milk inspection; general health—including sanitary inspection, indigent sick and contagion; quarantine; detention hospital; clerical work; housing; meat inspection; contagious diseases and vital statistics.

The death-rate for the city, based on a population estimate of 500,000 for the year 1913, was 11.59 per 1,000 and the infant mortality rate was 78.73. No rates are given for previous years, however, and so no comparisons can be made by the reader.

The tuberculosis rate for the native population, according to the commissioner, is increasing and there is a great need of nurses for visiting homes and giving instruction to the tuberculous. A table showing age distribution for tuberculosis shows the highest incidence for any five-year period to be between the ages of 25 and 30 years. As regards occupational distribution, housewives, laborers and students appear to be the most susceptible in the order named.

Fifty-eight cases of smallpox with no deaths were reported. Five of these had been vaccinated before exposure but they were adults who had been vaccinated in childhood. Seven cases of leprosy were reported for the year with one death.

The fact that only 171 cases of gonorrhœa and 193 cases of syphilis were reported shows that the state law requiring the reporting by number of all cases of venereal disease treated, is not being enforced.

Nine of the ten cases of pellagra reported were fatal. One death occurred due to rabies.

Reports were received during the year of 325 cases of typhoid fever. That case returns were not complete is indicated by the fact that the case fatality rate based on this number was 16.92 per cent.

Flexner serum was administered in 41 cases of cerebro-spinal meningitis while 22 cases were not so treated. Twelve of the cases where the serum was used recovered. Five of the cases where the serum was not used, got well.

Cold storage is termed by the fruit and vegetable inspector, "one of the greatest blessings the people of our country have enjoyed." The reason, in his opinion, that the public is so much prejudiced against cold storage is that unscrupulous dealers have persisted in labeling only culls and rejects as "storage" and in selling the better quality of storage produce as "fresh."

The year's expenditures by and for the department totaled $115,708.11 and the receipts amounted to $6006.74. Salaries cost the city $98,674.98 of the above.

NOTES.

"Typhoid Mary" Again.—"Typhoid Mary"—wholesale disseminator of disease—for two years lost from the observation of the New York City Health Department—has appeared again! She is now charged with the responsibility for the recent typhoid epidemic of twenty-five cases in Sloan Hospital in New York City, and is again in detention in River Side Hospital—North Brother Island—where she was kept in confinement from March 20, 1907, to February, 1910.

Mary Mallon is perhaps the most famous "carrier" in the world and the persistence with which typhoid fever—to which she herself is immune—follows her—and makes an inevitable appearance in the families or institutions in whose kitchen she cooks—has made her name synonymous with the term, "human carrier." She was first apprehended as a "carrier" in 1906 after having been instrumental in starting several small—and at least one large epidemic. She was detained under constant observation for three years—but she was finally freed in 1910—under the promise that she would report regularly to the health department and would not engage herself as a cook.

The Sloan Hospital epidemic of January and February was traced to the kitchen as food borne with the cook as the probable cause. She left the institution at once but was later found and confessed her identity as Mary Mallon. She had been working under an assumed name.

⁂

Health Teaching by Leaflets.—The *Medical Officer* for February 27 takes occasion to comment favorably upon a method of health education employed by the Maine State Board of Health. It is generally admitted that the most efficient method of teaching domestic hygiene is through the schools. Acting upon this principle the Maine State Board of Health has issued a number of leaflets each one of which summarizes in simple language the important points concerning some topic of public health interest such as "The Teeth and Their Care", "The Care of Milk in the Home," etc. These leaflets are sent to the teachers throughout the state. Each leaflet is made the text of a particular lesson and after the subject is thoroughly explained each child is allowed to take one of the leaflets home.

Clean Up!—The following good advice is being dispensed by W. C. Folsom, Chief Sanitary Inspector of Cincinnati, Ohio:

"The Chamber of Commerce is now agitating the second real clean-up campaign in the history of Cincinnati. Will it be a success? Of course; but it depends entirely upon the coöperation given by each and every citizen. Individually and collectively we must 'put our shoulders to the wheel and help. You ask, 'What can I do?'

"You must act. To talk and complain is not enough. Clean up your entire premises first, then look for trouble elsewhere. Begin today.

"Your own cellar needs attention. Remove all the dirt, rubbish and articles you will never use again. If you have a furnace, burn the combustible materials, otherwise place the papers, ashes and rubbish in receptacles and let the city wagons take it away. Articles useless to you but valuable to others will be glady taken by the charitable organizations.

"When your cellar is clean and orderly look over the attic and storage room. Repeat the process.

"The back yard comes next. Rake over the grass, pick up the tin cans and papers, remove the unsightly objects, repair the outbuildings and fences, whitewash the chicken house inside and paint the outside, repair the chicken run and clean up the filth, wash out the brick or cement pavement, and do the other hundred and one little things to make it clean and tidy.

"Provide a water-tight and fly-proof covered metallic garbage can. Look over the one you have; if it is in bad shape, buy a new one. It is a duty you owe the community to keep all garbage in the required container.

"Covered metallic cans are required for papers and ashes. Now is the time to provide your home with fire-proof and sanitary receptacles.

"Have you a stable? If so, it probably needs a cleaning. Do it now. Provide a tight, fly-proof box or pit in which to keep all manure. Use disinfectants about the stalls and in the box after each emptying. Disinfectants will drive away the adult flies and prevent the eggs from hatching. The majority of flies breed in manure.

"When all this is done, Mr. Owner or Mr. Tenant, you can and should see that the unsanitary conditions of the neighborhood are eliminated.

"If a vacant lot needs cleaning, why not get your neighbors to "chip in" and hire someone to clean it? Don't consider you have done your duty by simply reporting the condition to the Chamber of Commerce. Anyone can complain. We ask your complaints only after you personally have tried and failed to have the condition remedied.

"Begin today. Now is the time to act. Do your part at once. Madam, it is your duty to see that your husband and sons 'get busy.' "

*

Is Inspection Worth While?—A school survey instituted in Marshall County, Minnesota, to ascertain actual conditions in regard to the health of rural school children, brought out the following facts, according to Dr. H. W. Hill of the Minnesota Public Health Association:

"The returns from 397 children showed that less than 17 per cent. had perfect teeth; two-thirds had had toothache; nearly two-thirds had had measles; almost as many, mumps; one-third had had whooping cough; 9 per cent. scarlet fever; 4 per cent., diphtheria; while over-one-half had colds during the one month of the investigation, 138 having colds at the time the answers were written. Defective sight was found in 15 per cent., and defective hearing in about 7 per cent. There were 87 absences during the month on account of illness."

*

"Keep Well Leaflet."—The Bureau of Public Health Education of the New York City Department of Health has issued recently the first of a series of "Keep Well Leaflets." The leaflet is addressed to "Mr. Indoor Worker."

In several brief, concise and pointed paragraphs appropriately illustrated, attention is called to the vital need of every person employed at indoor work of plenty of fresh air, sufficient and well-placed light, rest, recreation, physical exercise and proper food.

Mr. Bookkeeper, Mr. Clerk, Mr. Shopworker, Mr. Tailor, Mr. Shoemaker, Miss Stenographer, Miss Saleslady, Miss Dressmaker, Miss Garment Worker, and Miss Milliner are each detained one moment, just long enough to be questioned about under-nourishment, flabby muscles, round shoulders, faulty chest development, diminished chest expansion, sallow complexion, anæmia, impaired vision, constipation, head-ache, lack of appetite, and nervousness. Sane and striking advice is given in a plain and acceptable way. The logic of the style and the general attractiveness of the leaflet help it to do that almost impossible and important task—persuade the working man or woman who is not sick that care must be exercised to keep well.

*

Will Inspect Meat.—Louisville, Ky., will inspect all of its meat rigidly in the future if its new ordinance is enforced. When it was recently shown that some of the Louisville butchers were killing horses and selling their flesh for food, sentiment in favor of inspection waxed exceeding strong. The ordinance aims to impose such restrictions and conditions that when the local butchers have complied, they will be eligible to federal inspection, which will cost them nothing and will relieve the local board.

*

Public Pays for Quarantine.—The December *Bulletin* of the Indiana State Board of Health contains a note on the legal enforcement of payment for quarantine supplies by the city. Not all will agree with them but it is interesting to see how much it is favored in Indiana.

"The city authorities of Goshen, according to advice of their attorney, refused to pay for supplies for quarantined families. The groceryman who furnished the supplies brought suit and secured payment. The judgment was rendered by Judge James S. Drake, of the Circuit Court of Elkhart County. The case read: Albert C. Folks and Frank Folks vs. the City of Goshen and Township of Elkhart, on account. Judge Drake held that the township was not liable but that the city must pay the bill and so the costs were assessed against the city of Goshen. Other courts have decided that a family under quarantine is virtually in prison for the benefit of the public, not for its own benefit. There is no question about supporting a prisoner when he is committed, why, therefore, should there be any question about supporting an individual or family when quarantined? There have probably been ten or twelve decisions of this kind and yet city attorneys are continually advising against the payment of bills incurred on account of quarantine."

A New Version.—The *Bulletin* of the Detroit Board of Health for December contains a nursery rhyme with a moral. It is so to the point and so many—who would not otherwise become acquainted with conditions—may be enlightened through it that it is printed here as follows:

"This is the barn that Jack built.

"This is the outhouse that stood by the barn that Jack built.

"This is the filth that lay by the outhouse, that stood by the barn that Jack built.

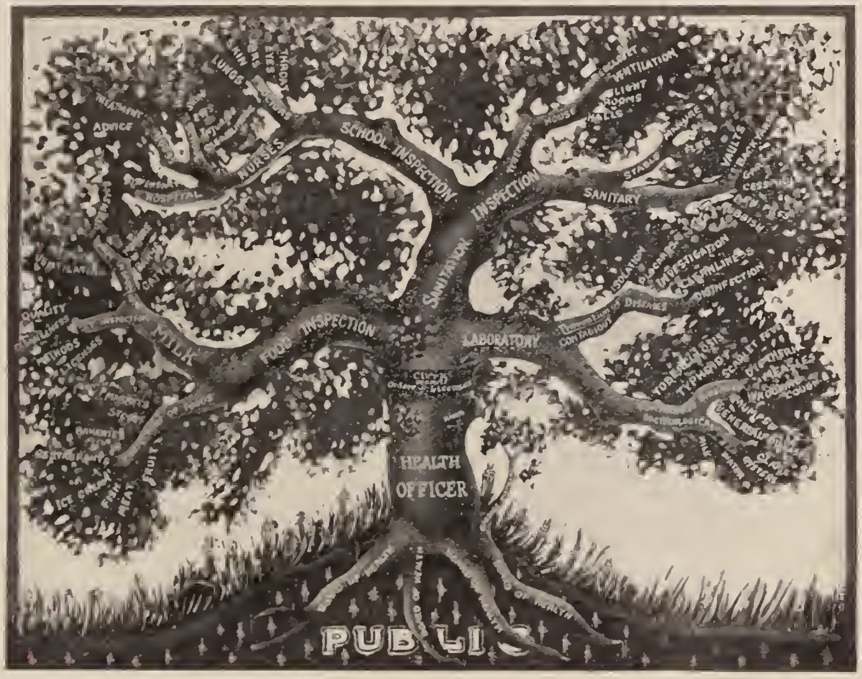
"This is the fly with his dirty feet, that was bred in the filth, that lay by the outhouse, that stood by the barn that Jack built.

"This is the pail, that carried the fly, that was bred in the filth, that lay by the outhouse, that stood by the barn that Jack built.

"This tubercular cow with the crumpled horn, was milked into the pail, that had carried the fly, that was bred in the filth, that lay by the outhouse, that stood by the barn that Jack built.

"This is the milker, all dirty and torn, who milked the sick cow with the crumpled horn, into the pail, that had carried the fly, that was bred in the filth, that lay by the outhouse, that stood by the barn that Jack built.

"This is the dealer, all shaven and shorn, who hired the milker, all dirty and torn, who milked



Soil—The Public—Furnishes the sustenance
Fertilizer—Appropriations—Stimulates growth
Roots—Board of Health—Strength and stability
Trunk—Health Officer—Bears the burden
Sucker—Garbage Service—Should be removed
Band—Clerk—Unites the branches
Branches—Work of the several bureaus

From Bulletin of the New Haven, Conn., Board of Health;
Frank W. Wright, M. D., Health Officer.

the sick cow with the crumpled horn, into the pail, that had carried the fly, that was bred in the filth, that lay by the outhouse, that stood by the barn that Jack built.

"This is the baby—sick and forlorn! who had milk from the dealer all shaven and shorn, who hired the milker, all dirty and torn, who milked the sick cow with the crumpled horn, into the pail, that had carried the fly, that was bred in the filth, that lay by the outhouse that stood by the barn that Jack built."—*Farmers' Review.*

✤

Crowded Cars—A Health Menace.—*Letter from the Mayor of New York City to the Commissioner of Health.*—The *Weekly Bulletin* of the Department of Health of New York City, March 6, contains the following letter:

February 26, 1915.

Dr. S. S. Goldwater,
Commissioner of Health:

Sir:

It is plain that the accommodations which are offered to passengers on many of the transit lines in the City are not what they should be. Complaints have been particularly numerous during the past winter; such complaints have been made directly to this office and have been voiced freely in the public press. The Bulletin of the Department of Health shows that similar complaints have reached your Department, and that citizens, despairing of obtaining any relief through the Public Service Commission, look to the Department of Health for help.

Section 1176 of the Charter reads in part as follows:

"Whenever any business pursuit shall, in the opinion of the Board of Health, be in a condition or in effect dangerous to life or health, said Board may enter in its records the same as a nuisance, and order the same to be removed, abated, suspended or improved."

Cannot the Department of Health, acting in accordance with this provision of the Charter, take steps to abate the nuisance of overcrowding? There should be better conditions on all of the lines during non-rush hours, and no company should be excused from the duty of using, at any time, as many cars as it may be safe and possible to operate up to the limit of the number required to safeguard the health of its passengers.

You have shown that overcrowding is a menace to health, and the courts will undoubtedly sustain you in a vigorous attempt to obtain relief from the present notorious and intolerable conditions which offend not only against health but against decency.

Please take this matter up at once. I shall be ready to confer with you at any time as to the methods to be pursued, and to give you what assistance I can in accomplishing the desired object.

Yours very truly,
(Signed) JOHN PURROY MITCHEL,
Mayor.

Following the receipt of the above letter the Board of Health took action, ordering the New York Railways Company to so regulate their service that the total number of passengers on cars of named avenues and streets "shall not exceed one and one-half times the seating capacity of such cars."

✤

Just as Dead.—The North Carolina *Health Bulletin* published in the March issue the following with the title "Just As Dead." We suggest the addition of "Or Deader?" with the interrogation mark as a possible improvement:

"It doesn't seem to occur to the average person that tuberculosis or Bright's disease, typhoid fever or pneumonia, will kill a person just as dead as smallpox. To hear a lot of persons talk, one would think that smallpox is so fatal that it would kill a man about ten times as dead as any of the other diseases."

✤

Prevention is Not Spectacular.—The January Toronto *Health Bulletin* contains the following which should be brought to the notice of the public:

"It has been repeatedly observed that one of the principal reasons why preventive medicine is not more highly appreciated and does not receive better financial support, is the fact that deaths from any disease lack tragic interest. A little life crushed out by an automobile or street-car receives marked publicity through the press and elicits universal sympathy, and naturally so; but the fact that on the same day several in the same municipality had died in their beds from preventable diseases, creates no comment.

"The number slain in the present war already is truly appalling, and how many lives will yet be sacrificed no one can predict. During the twenty-five years in which Germany has been preparing for this war there has been going on a constant civil war between all the nations now engaged and the germs of preventable diseases; these diseases having carried off in these 25 years 94,500,000 human beings in addition to the millions who have survived these ."

DEPARTMENT OF HEALTH==CINCINNATI OHIO

DIVISION OF FOOD INSPECTION

MILK DEPOT SCORE CARD

Name of Plant

Address Phone

Milk Received Gals; Cream { Sweet Gals. / Sour Gals.

Number of Shippers Butter mfg. Lbs.

All milk produced by dealer Amount

No. of employees handling milk and Equipment Drivers

Condition of delivery wagons

Time milk received Time of pasteurizing

Make of pasteurizer

Permit No. Time of Inspection

Date of Inspt. 191

Date of last Inspt. 191

Remarks

DETAILED SCORE

EQUIPMENT		SCORE	
		PERFECT	ALLOWED
BUILDING:			
Location		2	
Free from contaminating surroundings		4	
Arrangement		16	
Separate receiving room	1		
Separate pasteurizing and bottling rooms	3		
Separate wash room	2		
Separate boiler room	2		
Separate refrigerating room	2		
Separate dressing room for employees	3		
Sanitary, convenient toilet and washing facilities for employes	3		
Construction		23	
Impervious floors	2		
Floors tight, sound, cleanable	2		
Walls impervious, 4' high	1		
Walls tight, sound, cleanable	2		
Ceiling tight, smooth, clean	2		
Floors well drained	2		
Trap sewer connections	2		
Provisions for pure air	3		
Provisions for light	3		
Screens or cloth windows and doors	3		
Minimum of shafting, pulleys, hangars pipes, etc.	1		
APPARATUS:		35	
Boiler	2		
Turbine bottle washer	2		
Bottle soaker	1		
Sterilizer for bottles	5		
Sterilizer for cans	3		
Condition of cans	2		
Pasteurizer	5		
Efficiency (Note 2)	4		
Recording thermometer	2		
Bottling machine	2		
Capping machine	2		
Wash bowl, soap and towel in handling room	2		
Refrigerating machinery	1		
Milk clarifier	2		
Cooler	5	[illegible]	
Milk protected	3		
Milk exposed	1		
CONDITION OF HANDLING MACHINERY		4	
LABORATORY EQUIPMENT		2	
WATER SUPPLY		5	
Clean and fresh	3		
Convenient and abundant	2		
		100	

METHODS		SCORE	
		PERFECT	ALLOWED
BUILDING:			
Cleanliness		17	
Floors	2		
Walls	2		
Ceiling	2		
Doors and windows	1		
Freedom from odors	2		
Freedom from flies	4		
Pipes, cans, shaftings, etc.	3		
General neatness	1		
APPARATUS:			
Cleanliness		17	
All equipment thoroughly washed, rinsed and sterilized immediately after use	3		
Milk handling machinery	3		
Sterlized with live steam	4		
Protection from contamination	3		
All equipment resterilized immediately before use	4		
BOTTLES		11	
Thoroughly washed and rinsed	2		
Thoroughly sterilized with steam 15 min. or boiling water 5 min.	5		
Steam jet	1		
Inverted in clean place	3		
HANDLING MILK		42	
Received below 50°	4		
Received between 50° and 60°	2		
Received between 60° and 70°	1		
Rapidity of handling	3		
Freedom from undue exposure to air	3		
Cooling	3		
Prompiness	2		
45° or below	4		
45° to 50°	2		
Bottle capping machine	2		
Bottle caps sterilized	3		
All milk and cream pasteurized	5		
Protection during delivery (Iced in summer.)	2		
Storage; below 50°	4		
All milk clarified	2		
MISCELLANEOUS			
Cleanliness of employes		13	
Personal cleanliness	2		
Clean, washable clothing	2		
Cleanliness of delivery outfit	2		
Name, address and permit No. on wagons	1		
Inspection of dairies supplying milk	2		
Bacteriological examinations made	4		
Total		100	

Score for Equipment Score for Methods

NOTE 1.—If any condition in any particular, is exceptionally bad the total score shall be nothing.

NOTE 2.—Flash heating to 146 F.-30 min. holding, with immediate cooling efficient. Vat pastourizering requiring more than 12 minutes heating 70° to 110° or same to cool not efficient.

Under Remarks report time of heating, holding and cooling.

Water Supply

Condition Laboratory Report

Water Sample Submitted (Date)

Illness in family, employes, or their families within last 30 days?

Typhoid Scarlet fever

Diphtheria

Any other contagious or infectious disease in family, employes or their families

"Sore Throat" must be immediately reported to health officer

I have been instructed as to requirements and understand same and am personally responsible for Chemical and Bacteriological standard of the product.

(Signed)
Proprietor-Manager

(Signed)
Inspector

FILE NO.

Approved
J. H. LANDIS, Health Officer.
R. B. BLUME, D. V. S. Chief Food Inspector.

What is Your Motto?—"Public health is purchasable. Within natural limitations a community can determine its own death-rate."—*Weekly Bulletin*, New York City Department of Health.

"Sanitary instruction is even more important than sanitary legislation."—Duluth (Minn.) Health Department, *Monthly Bulletin.*

"No sanitary improvement worth the name will be effective, whatever acts you pass or whatever powers you confer on public officers unless you create an intelligent interest in the public mind."—City of Winnipeg—*Bulletin.*

"Nothing great was ever achieved without enthusiasm."—*Monthly Bulletin*, New Haven, Conn.

"Public health is the foundation upon which rests the happiness of the people and the welfare of the state."—DISRAELI. *Monthly Report*, Toronto, Canada.

"Reform directed towards the advancement of public health must ever take precedence over all others."—DISRAELI. *Health Bulletin*, Toronto, Canada.

"Money spent for the public health is an investment, not an expenditure. It costs less to keep the people well than to get them well."—*Health and Hygiene*, Louisville, Ky.

⁂

Health Officers' School.—The following announcement in the Kansas Health Bulletin of the Health Officers' School, now in session, tells of the thorough and modern way one state is endeavoring to work out its public health salvation.

"The Fifth Annual School for Health Officers and Physicians will be held this year the two weeks beginning Monday, April 19, to and including Saturday, May 1. The first week will be given at the University at Lawrence, and will consist practically of postgraduate work in the fundamental sciences of medicine given by the faculty of the School of Medicine. The second week will be given at the Bell Memorial Hospital at Rosedale, the forenoon of each day to be devoted to clinics in the hosptial, and the afternoons to distinctively public health instruction.

"Three of the most distinguished sanitarians in the United States have been secured for giving the instructional work of this public health course, namely, Surgeon M. J. White, of the United States Public Health Service, Doctor John S. Fulton, secretary of the Maryland State Board of Health, and Doctor A. J. Chesley, epidemiologist of the Minnesota State Board of Health. Other work will be given by the faculty of the School of Medicine and the officers of the State Board of Health."

⁂

Trachoma in Kentucky.—In the Public Health Report of March 5, 1915, Surgeon Jno. McMullen, of the United States Public Health Service, reports the results of a Trachoma Survey in the mountain section of eastern Kentucky. The type of disease found in the 23 counties investigated is very severe and mutilating in its effects. The following excerpts show the prevalence and immediate need of preventive measures:

"A total of 18,016 persons were examined, and 1,280, or practically 7 per cent., were found to be suffering with trachoma. Of this number 16,696 were school children and 1,324 were persons examined outside of the schools."

. . . . .

"As a large number of cases are known to exist in the other sections of the state the urgency of beginning the work of eradication and prevention becomes apparent. There is abundant evidence that trachoma is increasing, and, should history again repeat itself, every condition is present for a repetition of the fearful epidemics of this disease experienced in Europe in the nineteenth century.

"These thousands of cases of trachoma known to exist in Kentucky should be given prompt relief, both from a public health standpoint to prevent the further spread of the disease, and to save the patient from becoming a burden to himself and to his friends, and often a public charge. The service has demonstrated that trachoma hospitals can be operated at a comparatively small cost. It is now the duty of the state and local authorities to establish a sufficient number of these hospitals in the infected regions to be within easy reach of the trachoma patients.'

⁂

Licensed Barber Shops.—The greater part of the February issue of the *Bulletin* of the Winnipeg Department of Health is devoted to the inspection and licensing of barber shops. The relation of sanitary barber shops to the public health is recognized and this city intends to see that such sanitation prevails. The conditions in some shops are here exemplified:

Recently we find that a good many new shops have been opened, and these of a kind very poorly equipped. Attempts are made to open up barber shops in very unsuitable places, some without plumbing. Only last week we found a case where a barber's chair had been placed in the front parlor of a cottage with only an archway between the barber shop and the dining room. The bedroom also opened into the operating room.

Then we have the poorer class of barber shop, where a small store is rented and a wash-basin installed. Frequently, in order to save rent, rooms are partitioned off in rear and used for living purposes, the centre rooms often being without any windows. Of course, when discovered the living rooms are closed unless they are in rear of a corner store where double sash windows can be had on at least two sides of the building.

*

Investigate Laundries.—An investigation was recently made by the Department of Health of the City of New York into methods employed in commercial laundries in that city. Three places were visited, one being found in an insanitary condition. The investigation appears to show that vermin are not killed in the process of washing. Bacteriological examinations were made as follows: The organisms used as the indicators were the bacillus prodigiosus and bacillus coli. Cultures of these organisms were applied directly to the garment; placed on squares of gauze and folded into muslin and sewed into the garment; placed on squares of flannel blankets and folded into muslin and sewed into the garments. The garments were then placed in the center of the bag and passed through the washing process. When the garments were returned to the laboratory they were placed on sterile tables and the squares of gauze and flannel were cut into small pieces and placed into medium. These preliminary tests indicate that in the present laundry methods of "wet washing" neither the height of the temperature nor the duration of the application of the cleansing solution is sufficient to penetrate the interior of the bundles to such an extent as to destroy completely certain kinds of organisms.

Personal Notes.

Honor to Whom Honor is Due.—Dr. John N. Hurty, Secretary of the Indiana State Board of Health and former President of the American Public Health Association was honored on the fourteenth of March with an "Anniversary Banquet," at the Claypool Hotel in Indianapolis. The banquet was given by Indiana physicians and celebrated the beginning of the twentieth year of Doctor Hurty's service in Indiana health work. About 225 people attended the banquet —and large numbers of telegrams were received from prominent health workers and authorities over the entire country.

Governor S. L. Ralston of Indiana presided as master of ceremonies and prominent speakers on the toast list were: Dr. Victor C. Vaughn, Ann Arbor, Michigan; Dr. Geo. H. Simmons, Chicago; Dr. A. R. Craig, Secretary American Medical Association, Chicago; Dr. W. A. Evans, Chicago; President W. E. Stone and President W. L. Bryan, representing the two Indiana state universities. Doctor Hurty was presented with a "Huxley vase" by Thos. R. Marshall, Vice-president of the United States—a testimonial from Indiana physicians—and the secretary's response to this tribute ended the program.

"During my term as health officer in Chicago," said Dr. William A. Evans, former health commissioner, Chicago, "I had frequent opportunity for learning from Hurty. The state of Illinois and the city of Chicago are under obligations to Indiana for placing Doctor Hurty in this office and for continuing him in it. I was better able to discharge my duty because down in Indiana, Hurty was discharging his duty." His subject was "The Turbulent Life of a Health Officer."

"It is possible there never has been any doubt in the minds of intelligent people as to the value of health to the individual," said Dr. W. E. Stone, president of Purdue university, at Lafayette, "but it is only in recent years that we have begun to realize the value of health as an asset to the state. The old idea was that health was man's private affair. Doctor Hurty has been called the most useful citizen of Indiana, and I am sure that no one that knows what he has accomplished will begrudge him this. He deserves all the praise and honor that individual people can bestow upon him."

In his response, after the presentation of the Huxley vase, Doctor Hurty said:

"My thought is one of joy and great delight. Never before, in all my experience, has approbation been apportioned to me in such liberal measures. I never dreamed of any such occasion. I am more accustomed to kicks."

Doctor Hurty gave a brief summary of the history of the department of health since he has been health commissioner, and told of the laws for the benefit of humanity which have been passed by the legislature and of the uphill fight he has had in getting the people to follow his suggestions.

Of the hundreds of telegrams received from those unable to be present, the following three are typical of the sentiment expressed by all:

Dr. Geo. M. Kober, Washington, D. C.: "The American medical profession has long since considered Doctor Hurty as one of the foremost sanitarians in this country, whose efficient work as a health officeral has had its influence, not only in your state, but wherever attention is given to public health activities."

Dr. M. J. Rosenau, Boston, Mass.: "He has been a pioneer in America and a leader of whom we are all proud. Doctor Hurty's long service and effective work makes him the dean of American sanitarians. It would be a grand thing if all of the states of our Union could have men like Doctor Hurty to guide and direc ttheir health problems."

Dr. Chas. V. Chapin, Providence, R. I.: "Even if his friends were not there to do him honor, the consciousness that he has done so much to advance the cause of public health, that he has stirred such an active and lively interest in sanitation, that he has saved lives and prevented sickness, that he has taught the mother how to protect her little one from disease, that he has put Indiana on the health map of the United States ought to give him cause for pleasure and happiness all the rest of his life."

Another County Health Officer.—Word has been received from the North Carolina State Board of Health stating that another addition has been made to the list of full-time health officers in that state by the appointment of Dr. M. T. Edgerton as Pitt County Health Officer.

Doctor Edgerton is a native of Carolina, and a graduate of Johns Hopkins and the university of Georgia. His appointment makes ten counties in North Carolina employing men giving their full time to health work.

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The following were elected to membership in the American Public Health Association on March 25, 1915:

George Porter, M. D., Toronto, Canada.
William Fletcher Jolley, M. D., Troupsburg, N. Y.
Thomas Jefferson Duffield, P. O. Box 272, Summit, N. J.
Iva M. Garrison, East Greenbush, Rensselaer, N. Y.
Geo. Theodore Boycheff, Solvay, N. Y.
Joseph Ramon Brown, Seward, N. Y.
Wm. R. Lane, M. D., Wantagh, N. Y.
Henry Francis Parker, Rockville Centre, N. Y.
Henry Wm. Taylor, Albany, N. Y.
Wm. Livingston D'Olier, Philadelphia, Pa.
Robert Carnahan Kirkwood, Lake View, Wash.
Robert Clarence Derivaux, Washington, D. C.
James R. Brown, New York.
Geo. A. Chapman, M. D., Glens Falls, N. Y.
Herman G. Germer, M. D., Canastota, N. Y.
Geo. J. Bryan, Fayetteville, N. Y.,
James Delavan Heard, Pittsburgh, Pa.
Albert Pierce Traynham, Richmond, Va.
Wm. Oliver Howell, 4310 Pine St., Philadelphia, Pa.
Alan Greenleaf Terrel, Riverhead, N. Y.
Ira Ayer, M. D., Philadelphia, Pa.
Edmund C. Van Dusen, Athens, N. Y.
Geo. D. Bradford, Homer, N. Y.
Calvin N. Barrick, Allentown, N. Y.
Ernest Leroy Wilson, Bolton Landing, N. Y.
Bertis Rupert Wakeman, Watertown, N. Y.
Charles Philip McCabe, Greenville, N. Y.
Seaver Z. Fisher, M. D., Randolph, N. Y.

Public Health Notes.

Progress in Baltimore.—The Fifth annual Health Conference of the Medical and Chirurgical Faculty of Maryland, was held in Osler Hall, February 8, 9, 10, 11, 12, and 13 with the following noted speakers on the program.

Dr. Harvey W. Wiley, subject, "The Wealth of Health"; Dr. W. L. Rodman, "Pre-cancerous Lesions"; Dr. Arthur Cramp of Chicago, "Fakes and Frauds in Medicine"; "Physical Aspects of Play," Dr. William Burdick, Director Public Athletic League of Baltimore; "Mental Hygiene" Dr. Adolph Meyer, Director, Phipps Psychiatric Clinic, Baltimore; "The Menace of Bubonic Plague," Dr. Wm. C. Rucker, United States Public Health Service; "Sanitary Needs of Maryland," a symposium by Dr. L. L. Lumsden, United States Public Health Service, Dr. N. R. Gorter, Health Commissioner of Baltimore, and Dr. John S. Fulton, Secretary, Maryland State Board of Health.

Public Health Exhibits of the Association, Public Athletic League, Lung-Motor, Workshop for the Blind, Shepherd & Pratt Hospital were open every afternoon and evening to the public and each night one or two appropriate moving picture films were shown prior to the lectures.

It was estimated that over three thousand persons attended the several meetings, which was the high-water mark since the Conferences were started.

As a direct sequence of this very successful meeting the Committee on Public Instruction planned a three-night program exclusively for the colored citizens of Baltimore, which took place, March 24, 25 and 26.

The logical outcome of this meeting, the theme of which was tuberculosis as affecting the colored race, is first to form a Colored Public Health Association and second to urge the appropriation of sufficient money by the city and state for building a hospital for colored patients suffering from this disease. Through the Association it is hoped to better the conditions surrounding the entire population of the city as well as to supply better dispensary conditions and wider reaching instruction of how to take care of the tubercular who must now live at home.

The Committee on Public Instruction of the Medical and Chirurgical Faculty of Maryland was formed about eight years ago and the work which it did in supplying speakers upon health topics as well as meetings which it arranged for instructive purposes proved so far-reaching in its effects that a citizen of Baltimore, who was deeply interested in the work, supplied the funds to build and equip a public health exhibit, covering the five general subjects of Alcohol, Tuberculosis, Social and Mental Diseases and Baby Saving, at a cost of nearly $2,000. This exhibit has been shown in fourteen counties besides numerous times in various localities in the city itself, and at such times hundreds of copies of health rules and health hints have been distributed.

During the year 1914, the committee arranged and supplied speakers for nearly two hundred meetings and since January 1 has arranged for over one hundred, principally courses in First Aid to classes of teachers, Camp Fire Girls and Boy Scouts. A moving picture machine has been added to the equipment of the exhibit and has proven a wonderful audience-catcher.

When it is considered that 90 per cent. of this work has been cheerfully done by busy physicians without a penny of reward or remuneration except that given by a good conscience, it may safely be assumed that Baltimore is not behind in taking care of her health problems.

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Prophylactic Measures against Typhus.—Civic and military authorities in France are coöperating in an endeavor to prevent the spread of typhus fever from wounded soldiers and refugees who return from the trenches to the vicinity of Paris. All such persons are examined to determine whether they are carriers of lice before they are admitted to the hospital and the standard course of procedure is somewhat as follows: The patient is taken to an examining room near the entrance of the hospital. This room is well lighted and furnished in a sanitary manner. The physician in charge makes a thorough examination of all parts of the body to determine whether lice are present. The clothes are removed and placed in a covered receptacle in which they are taken to the disinfecting room. The patient is given a bath in both hot and cold water. If he is known to carry lice the hair and beard are clipped and the skin surfaces soaked in xylol of benzine. The patient then undergoes a thorough rubbing with black soap and sometimes mercurial ointment is used upon special surfaces. The patient is examined upon a portable linen litter upon which he is later removed to the hospital ward. The disinfecting room is a small close chamber and forty to fifty grams of sulphur per cubic meter are burned in the disinfection. The examining physician takes special care to avoid infection and the whole process is most carefully carried out.—*Revue D' Hygiene*, January 20.

◆

The Schick Toxin Reaction for Immunity in Diphtheria.—*The American Journal of Diseases of Children*, March 1915, publishes an article by Doctor Kolmer and Doctor Moshage describing the value of the Schick test as it was observed in a large number of individuals at the Philadelphia Hospital for Contagious Diseases. This test is based upon the fact that if a small amount of diphtheria toxin is injected intracutaneously in the human skin it will be neutralized by antitoxin if the patient is immune; but if no antitoxin is present a local inflammation will appear as an indication of susceptibility to the disease. During the past year 1,265 inoculations have been made and from careful observations the authors draw the following conclusions:

"1. The toxin skin reaction is a valuable and reliable method for detecting susceptibility to diphtheria.

"2. Persons reacting negatively to this test usually contain at least 1-20 unit of diphtheria antitoxin per cubic centimeter of serum, and this amount of antitoxin is probably sufficient to protect against infection.

"3. Persons reacting weakly or strongly positive usually contain less than 1/20 of a unit of antitoxin per cubic centimeter of serum or none at all. These persons may be regarded as susceptible to diphtheria and in the event of exposure to infection should be passively immunized with an injection of antitoxin.

"4. About 40 to 50 per cent. of children ranging from 1 to 15 years of age react positively to the toxin test; this means that the preliminary use of the toxin test will eliminate the necessity of administering prophylactic doses of antitoxin to about 50 per cent. of children.

"5. The toxin reaction indicates that the immunity conferred by an injection of antitoxin begins to disappear after ten days and has generally passed away entirely after four weeks.

"6. The increased susceptibility of persons with scarlet fever to diphtheria is shown by the toxin reaction; even after the injection of antitoxin about 10 per cent. are susceptible within ten days.

"7. According to the toxin reaction the immunity conferred by an attack of diphtheria is usually of short duration or entirely absent.

"8. The most practical application of the toxin reaction consists in applying the test as a preliminary measure to all persons who have been exposed to diphtheria and immunizing only those who react positively."

◆

Infant Hygiene.—*The Modern Hospital*, in the March number, comments upon the need of a better understanding and control of anti-natal hygiene and the hygiene of the eyes.

The last census report shows that 80 per cent. of the death of babies under one month was due to premature birth, congenital debility, injury at birth, malformation and convulsions. It seems obvious that anti-natal hygiene and efficient obstetrics could do much to remedy conditions. During the year 1913 in New York city one-third of the births were attended by midwives and the establishing of a school for midwives which is intended to raise the standard of the profession in that city seems to have been a much needed step. In many of our larger health departments a division of child hygiene has already been established.

Our responsibility in the prevention of blindness is emphasized by the universal efficiency of the treatment for opthalmia neonatorum and the fact that 25 per cent. of the pupils in schools for the blind are victims of this disease. The two remedies suggested are publicity and legislation.

◆

An Iodine Fumigator.—The *New York Medical Journal* of March 20 prints an article by Doctor Capell of Omaha describing an iodine fumigator consisting of a cylinder for the purpose of vaporizing the iodine and a rubber bulb which forces air into the cylinder and forces out the iodine fumes through the opposite arm. Crystals of iodine are placed in the cylinder which is then closed with a cork and the cylinder is held over the lamp. The iodine is vaporized and forced out of the open arm in the form of purple fumes. Iodine in this form is stated to be an excellent sterilizing agent for use upon the external surfaces and cavities of the body. It is absorbed quickly and is irritating only to the extent of a temporary smarting. The application may be quickly made, the fumes reach all parts of the surface and the stain lasts but a few minutes. The excellent germicidal properties which we know iodine to possess as well as the many cures in cases of tonsilitis, laryngitis, catarrh, etc., which Doctor Capell has secured by this treatment would seem to testify to the value of this device.

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Epidemic Cerebrospinal Meningitis.—The March number of *Public Health* (London) discusses to some length the nature of the above disease. It seems to have occurred in the first, second and seventh centuries in Italy but has been epidemic in Europe and America only since 1905. Progress in dealing with the disease dates from the discovery of its cause by Weichselbaum in 1887. The Meningococcus is a Gram negative diplococcus, grows well on blood-serum media but fails to grow at room temperature. This latter characteristic distinguishes it from several other diplococci. The colonies are never confluent as with Gonococcus and it is further distinguished by being easily emulsified in salt solution. Other bacteria such as Pneumococcus, Streptococcus and the tubercle bacillus produce meningitis but not in the epidemic form.

Epidemics have usually broken out among collections of individuals and, since the organism chooses the naso-pharynx as its place of abode, coughing, sneezing and spitting are probably associated with the spread of the disease. The organism is so fragile that cultivation is difficult but it may exist in the throat for some time and if the vitality of the person is lowered it may produce the disease.

Eighty to 90 per cent. of all cases are in persons under fifteen years of age. Most patients suffer with naso-pharyngeal catarrh but where the resistance is lowered the organism gains access to the central nerve system by way of the blood stream and is found in a cerebrospinal fluid and in meningeal pus from the spinal cord and brain. The fatality in epidemics has been about 70 per cent.

Well people may carry the disease but they do not correspond to the typhoid carrier. They are people that have been subject to chance infection and the system soon rids itself of the organism.

*

Antityphoid Vaccination in the United States Army.—It is of interest to know of antityphoid vaccination in the United States Army. The vaccine is derived from a single strain of low virulence obtained from a patient at Netley, England, in 1900. The vaccine is used in less than four months after its preparation and it is found that in 96 per cent. of the cases the subcutaneous injection was followed by slight or negative reaction. Vaccine treatment was inaugurated in the army in 1909. Contrast the two deaths from typhoid among 13,000 men in camp in Texas in 1911 with 214 deaths among 11,000 men under similar conditions in Jacksonville during the Spanish American war. In September 1911 vaccination was made compulsory for all persons under thirty-five years of age. During the past year there were six cases of typhoid in the whole army, two in unvaccinated men and four in men who had received one dose but had been infected before receiving the vaccine. Immunity is thought to last for at least two years. Statistics show that vaccination has had the further effect of reducing the amount of tuberculosis."—*Johns Hopkins Hospital Bulletin*, March, 1915.

*

Pasteurization of Milk.—*The American Food Journal* publishes in its March issue an article describing the process and comparative advantages of the pasteurization of milk.

The advantages and disadvantages are summarized as follows:

OBJECTIONS TO PASTEURIZATION.

1. Increases cost.
    - a. By additional apparatus required.
    - b. By fuel required for heating.
    - c. By ice or ammonia required for cooling.
    - d. By increasing labor of handling.

2. *Conceals inferiority.
    - a. By encouraging carelessness.
    - b. Discouraging proper care.
3. Interferes with cream rising and whipping.
4. *Modifies taste.
5. *Less wholesome.
    - a. Acid less as lactic acid bacteria are destroyed.
    - b. Spore forms of bacteria are not destroyed.
    - c. Injurious by-products of bacteria not destroyed.
    - d. Milk is chemically changed.
    - e. Is less easily digested.
    - f. Produces scurvy and rachitis.

ADVANTAGES OF PASTEURIZATION.

1. Economic.
    - a. By keeping milk sweet longer.
    - b. By saving milk which otherwise would spoil.
    - c. By saving bills for sickness and milk-borne epidemics.
2. More wholesome.
    - a. Pathogenic bacteria destroyed.
        - (a) Those found in cow and causing tuberculosis, foot and mouth disease, splenic fever, streptococcus sore throat.
        - (b) Those infecting the milk later and causing typhoid fever, diphtheria, scarlet fever and diarrhoeal diseases.
    - b. Infant mortality less.
    - c. Bacteria decreased in number.

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Syphilis of the Oral Cavity.—No more important argument for the sanitary drinking cup can be offered than that contained in the conclusions of an article dealing with the above subject in the February *Journal* of the Florida Medical Association.

The author concludes:

"1st: It is practically impossible by inspection alone to differentiate syphilitic from nonsyphilitic sores and is only possible by means of laboratory methods.

"2nd: It is a safe rule to look with suspicion upon every ulcer of the mucous membrane of the mouth, throat and tonsil.

"3rd: Syphilitic ulcers of the mucous membranes of the mouth are highly contagious, in fact the most contagious of all specific ulcers."

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"Negroes in the United States."—The bulletin with the above title put out last month by the United States Census Bureau contains for the first time a statement in regard to negro mortality in the registration area in this country.

According to the report:

"The negro population of the area was 19.7 per cent. of the total number of negroes in the United States in 1910, and the deaths numbered 49,499, with a death-rate of 25.5 per 1,000 population—a decrease as compared with the rate in 1900, which was 29.4."

In a table of comparable data, from the 57 registration cities, each of which had, in 1910, a negro population of 2,500, or more, the following interesting information is tabulated:

"In the 57 cities the death-rate among negroes in 1910 was 27.8 and that among whites 15.9 per 1,000, the rate among the negroes being nearly twice as great as that for the whites. In the 33 Northern cities the death-rate among negroes was 25.1 and that among whites 15.7 per 1,000, while in 24 Southern cities the rate for negroes was 29.6 and that for whites 16.9. Thus the death-rates for each race were higher in the Southern than in the Northern cities, the difference between the races in respect to death-rate also being greater in the South.

"Both negroes and whites show decreases in death-rate in 1910 as compared with 1900, when the 57 cities are considered in the aggregate, the decline for the negroes being 3.4 and for whites 2.5 per 1,000 population. Every city in the South, except Key West, Fla., and Memphis, Tenn., showed a lower death-rate for negroes in 1910 than in 1900; the increase in Key West was only 0.2, while in Memphis it was 3.9 per 1,000.

"The general tendency appears to be in the direction of a declining death-rate for negroes in registration cities, the decrease being somewhat greater for negroes than for whites; as a result, the difference between the death-rate for negroes and for whites in these cities was not as great in 1910 as a decade earlier."

Another table shows that

"Deaths among negroes, as compared with the whites, are relatively more numerous for malaria, tuberculosis of the lungs, other forms of tuberculosis, pneumonia and whooping cough;

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*Some of the above alleged disadvantages of pasteurized milk were shown to be more fancied than real.

while for measles, scarlet fever, diphtheria, cancer, appendicitis, diarrhea, and violent deaths including suicide the distribution is noticeably higher among whites.

"In other causes the differences in the percentages are slight.

"The question as to whether the decrease in mortality among negroes in 1910 as compared with 1900 was due to permanent causes, such as improved housing conditions, better medical attention, and in general improved sanitary conditions, and not to the absence of epidemics, is an important and interesting one.

"Undoubtedly one of the factors which has caused the decrease in the death-rate—which decrease is almost universal in the cities of the South—is the increase in home ownership among the negro population."

In support of the last conclusion, a third table is produced, a study of which indicates that, "in the decade from 1900 to 1910 the number of homes owned by negroes in the Southern states increased by 102,912, or 31.4 per cent; this increase covering increase in farm homes of 30,449, or 16.7 per cent., and in other homes of 72,463, or 49.8 per cent."

*

Effects of Preserving Processes upon Virulence of Tubercle Bacilli in Milk.—The Local Government Board of the London County Council have issued a bulletin entitled "Report of the local government board upon the effects of certain condensing and drying processes used in the preservation of milk upon its bacterial content." This bulletin deals with two sets of experiments recently carried out by Dr. S. Delépine with the object of (1) Ascertaining the effects of certain drying processes upon the virulence of the bovine tubercle bacilli; and (2) the effect of drying processes upon the bacterial content of the milk.

Three methods of treatment were investigated. These included the manufacture of sweetened condensed milk, the drying of milk over heated revolving cylinders and the drying of milk by spraying into currents of hot air. Samples of the milk were collected before, during, and after treatment and were submitted to the following tests: Estimation of solids and reaction, microscopical examination of sediment, cultivation upon certain culture media, inoculation of guinea pigs and feeding to rabbits.

Of several cows kept for observation for some weeks, each suffering with tuberculosis of the udder, only one was found to be secreting a fair amount of tubercle bacilli at the time of the experiment. Live cultures of virulent bovine tubercle bacilli were mixed with the milk in the first set of experiments, so that the tubercle bacilli would be demonstrated by direct microscopical examination of any of the milk.

The first method under consideration was that of the manufacture of sweetened, condensed milk. In this method milk is heated to 40 or 45 degrees centigrade and held for some 20 minutes. The milk is then further heated to 92 degrees centigrade and kept at this temperature for six minutes. It is then cooled to 45 degrees centigrade and evaporated to one-third its original bulk. The total bacterial content of the mixed milk (raw) was 38,000,000. During treatment this number was reduced at one time to less than 50, while the finished product contained about 900 bacteria per cubic centimeter. The finished, sweetened product failed to produce tubercular lesions when inoculated and fed to either guinea pigs or rabbits.

The method of drying milk over heated, revolving cylinders was investigated at two different factories, and it was found that, while the total bacterial content of the milk was greatly increased, the finished product contained more bacteria per cubic centimeter than was found at one time during the treatment. In spite of the fact that the milk is heated during this process to a temperature of about 140 degrees centigrade, living tubercle bacilli were found in the dried milk, and when fed to rabbits and guinea pigs, produced lesions not unlike those produced by the inoculation of raw milk containing bovine tubercle bacilli of known virulence.

The second set of experiments were undertaken with the idea of ascertaining the effects of drying processes upon the bacterial content of the milk. Samples of milk containing known numbers of bacteria were dried both by revolving cylinders and by being sprayed under high pressure into currents of hot air, and samples were here taken at the beginning of the experiment, during the treatment and of the dried product, and bacteriological examinations were made. It was found that the reduction of numbers of bacteria was great, but the total count raised above the lowest point reached during some part of the process.

Doctor Delépine concludes that the increase in numbers of bacteria is due to re-contamination. The reduction was greatest in the manufacture of sweetened condensed milk: lowest in the process of drying milk by spraying into currents of hot air, while the treatment over revolving cylinders occupied amiddle position. In each case the bacteria appeared to have become shrunken during treatment.

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Wisconsin Eugenics Law.—A prominent physician of Milwaukee makes statement that the eugenics marriage law is "silly and absurd" and claims that it "makes liars and perjurers of physicians." This statement has been contradicted by the president of the Milwaukee Maternity Hospital, who says it has worked wonders "both in actually preventing the marriage of the unfit and in an educational way." After investigation, it was declared: "Any respectable physician can give a competent examination and not make himself a *liar* or *perjurer.*"

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Bat the Rat.—Walt Mason's humorous, yet important "Bat the Rat" plea appeared in the March *Health Bulletin* of North Carolina and we feel it worthy of repetition here:

"Oh, bat the rats, and break their slats, and hand the beasts their bitters! 'No quarter' goes—destroy the foes, for they are filthy critters! Let them no more infest your store, your costly goods devouring, but run them out—put them to rout, their legions overpowering. Oh, swat the brutes that chew the fruits and gnaw the loaves and cheeses, that go their way, day after day, distributing diseases. If you, I think, took pen and ink, and figured what rats cost you, the total would knock you dumb and pretty nearly frost you. It's bad enough to see them stuff themselves with costly plunder, to know they dwell in hole and cell all 'round the store and under; it's bad enough, it's surely tough to have to feed and lodge them; but worse yet is this, you bet—the fame those critters lend you; for folk will score your store, and no one will defend you. 'In yonder store I saw a score of rats,' exclaimed some matron; 'they were so thick they made me sick'—and thus you lose a patron.

"So, bat the rats with guns or cats, or anything that's handy, with lance or sword, or strip of board, sandbag or poisoned candy. From South to North let us go forth, attired in batting garments, from East to West, let's work with zest, and bat the dirty varmints. Let's bat the rat, the lean, the fat, the old one and the ratling; the gray, the brown, we'll hammer down, and never cease our battling."

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Cultivation of the Germ of Syphilis.—*The Journal of Experimental Medicine* (March 1915) describes the work of Doctor Zinsser and others in cultivating Treponema pallidum. Several methods are described but the successful cultivation in fluid media, composed of mixtures of slightly acid broth and sheep serum containing autoclaved tissue is of special interest in that it gives an excellent method for obtaining mass cultures for experimental work. By this method great quantities of the germs can readily be obtained for immunological experimentation.

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Favor New Marriage Laws.—Dr. Jas. J. Terrell of Temple, Texas, in an address delivered before the State Conference of Charities and Corrections at San Antonio late in 1914, outlined, after a detailed exposition of the marriage laws of other states, the provisions which he thought ought to be embodied in a model law for Texas. They follow:

1. Make it obligatory upon the male applicant for license to marry to present to the county clerk a certificate under oath by a legalized physician that said applicant is free from communicable acquired venereal disease, such examination to be made within two weeks of application.

2. Require physician to make careful physical and microscopic examination for gonorrhea, to make careful physical examination for chancroid and syphilis. A blood examination for the latter should not be required.

3. Prohibit the divulging of any information by those having official knowledge of the same, this to include the county clerk and the physician. This leaves it optional with the applicant to give out any information, and would not prohibit the relatives of the woman from explaining why the marriage does not take place if the applicant fails to secure the certificate.

4. In case of rejection by a physician, provide for an appeal to a commission of three physicians appointed by the county judge.

5. Provide that if a man having his residence in Texas shall marry out of the state and return to it under twelve months for residence he shall be required to file such certificate with the county clerk within thirty days after his return.

6. Affix fees for medical examinations at not more than $5.00.

7. Provide penalties for failure to observe these provisions.

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Water Supplies on Trains.—Bulletin No. 100 of the Hygienic laboratory takes up the question as the results of chemical and bacteriological examination of some 322 samples of water taken from the tanks of railroad cars arriving at the Washington station. Concerning the equipment on the different cars for storage and refrigeration of drinking water, the report states that the arrangements on the sleeping cars are satisfactory, while the equipment "for storage of drinking water on mail cars and day coaches is wholly inadequate." The majority of the dining cars seem to have a satisfactory equipment, as most of them are provided with filters of the Pasteur or Chamberland type. The report recommends that the storage capacity of water in coaches and mail cars be increased and that the ice and water be kept separate.

IMPORTANT MEETINGS.

National Commission on Milk Standards. The National Commission of Milk Standards will hold its annual meeting in New York City on May 7–8.

Delegates will be present from the International Milk Dealers' Association, the National Creamery and Butter-Makers' Association and the National Ice Cream Association. They will consult with the Commission on Milk Standards regarding the regulations which the commission is considering for control of these branches of the milk industry.

The question of holding a Clean Milk Congress will be presented for the consideration of these delegates. The secretary of the commission is Dr. Charles E. North, 50 Church Street, New York City.

*

The Seventh Pan-American Congress will meet in San Francisco, June 17–21, inclusive. It assembles pursuant to invitation of the President of the United States issued in accordance with an act of Congress approved March 3, 1915.

The countries and colonies embraced in the Congress are the Argentine Republic, Bolivia, Brazil, Canada, Colombia, Cuba, Chile, Costa Rica, El Salvador, Ecuador, Guatamala, Honduras, Haiti, Hawaii, Mexico, Martinique, Nicaragua, Panama, Paraguay, Peru, Santo Domingo, United States, Uruguay, Venezuela, British Guiana, Dutch Guiana, French Guiana, Jamaica, Barbadoes, St. Thomas and St. Vincent. The organization of the congress is perfected in these countries and the majority of them have signified their intention to be represented by duly accredited delegates.

The congress will meet in seven sections, viz.: (1) Medicine; (2) Surgery; (3) Obstetrics and Gynecology; (4) Anatomy, Physiology, Pathology and Bacteriology; (5) Tropical Medicine and General Sanitation; (6) Laryngology, Rhinology and Otology; (7) Medical Literature.

All members of the organized medical profession of the constituent countries are eligible and are invited to become members. The membership fee is $5 and entitles the holder to a complete set of the transactions. Advance registrations are solicited and should be sent with membership fee to the treasurer, Dr. Henry P. Newman, Timken Building, San Diego, California.

The First Pan-American Medical Congress was most successfully held in the United States in 1893. Five intervening congresses have been held in Latin American countries. It now devolves upon the medical profession of the United States to make this, the seventh, the most successful in the series.

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The Southern Sociological Congress will be held at Houston, Texas, May 8–11, 1915. General Secretary, J. E. McCulloch, Nashville, Tenn.; Theme: "The Conservation of Health." The six departments will cover communicable diseases, moral health, mental health, health of children, health and race relations, the church as a conserver of social health.

There will be a health exhibit which will probably be made up of southern material.

Industrial Hygiene and Sanitation.

Another New Departure.—The New York City Health Department is about to establish a new division—the Division of Industrial Hygiene, according to a recent bulletin. It is to be under the general supervision of the Director of the Bureau of Infectious Diseases, and will be closely associated with the Bureau of Public Health Education.

"The Committee on Public Health Education of the Advisory Council, which was recently requested by the Commissioner of Health to consider the advisability of establishing a Division of Industrial Hygiene, has endorsed the following report prepared by a sub-committee consisting of Dr. George M. Price, Chairman, Miss Frances Perkins and Alderman Jacob Weil."

The report declares that it is within the functions of the health department to establish a Bureau of Industrial Hygiene and outlines the recommended purposes of the new division as follows:

"1. The establishment of a central occupational disease clinic for research investigation of industrial diseases on the lines of the clinic of Professor Devoto at Milan, Italy.

"Such a clinic should be separate from the tuberculosis clinics although acting in harmony with them and in coöperation with the university and hospital clinics throughout the city.

"Such a clinic should be the central clearing house of all specific occupational diseases and industrial poisonings, should have ample means for research and investigation and should also study the prophylaxis of the various industrial diseases with which it comes in contact.

"2. The establishment of an industrial hygiene educational division which should endeavor by all means to spread the knowledge of the causes of industrial poisoning, the preventive measures to be taken in various industries and the right modes of work and living for the industrial population throughout the city.

"Such an industrial hygiene educational division should also, in coöperation with the various manufacturers associations and other existing bodies, as well as with the Department of Education, endeavor to conduct a general campaign of education among the manufacturers and workers as to the prevention of occupational diseases and the preservation of the health of the workers.

"A Bureau of Industrial Hygiene organized on the lines indicated would be a potent factor in the reduction of mortality and morbidity in the city and would add prestige and credit to the municipality and to its Health Department."

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"Child Labor Bills Pending in Twenty-Seven State Legislatures."—The *Survey* for March 6 contains an article with the preceding title, showing the interest and the evident necessity for such interest in many of our dates. These bills deal primarily with the issuance of work permits; age limits for child employment; length of daily employment; and age at which night-work shall he allowed. If twenty-seven of our states conceive good child labor laws, the time when all will obtain them should be very soon.

✤

"Do's" and "Don't's."—The Bureau of Mines in publishing the report of the Committee on Resuscitation from Mine Gases (Technical Paper 77), recommends the following procedure in giving first aid to those in need of artificial respiration:

"In case of gassing, remove victim at once from gaseous atmosphere. Carry him quickly to fresh air and immediately give manual artificial respiration. Do not stop to loosen clothing. Every moment of delay is serious.

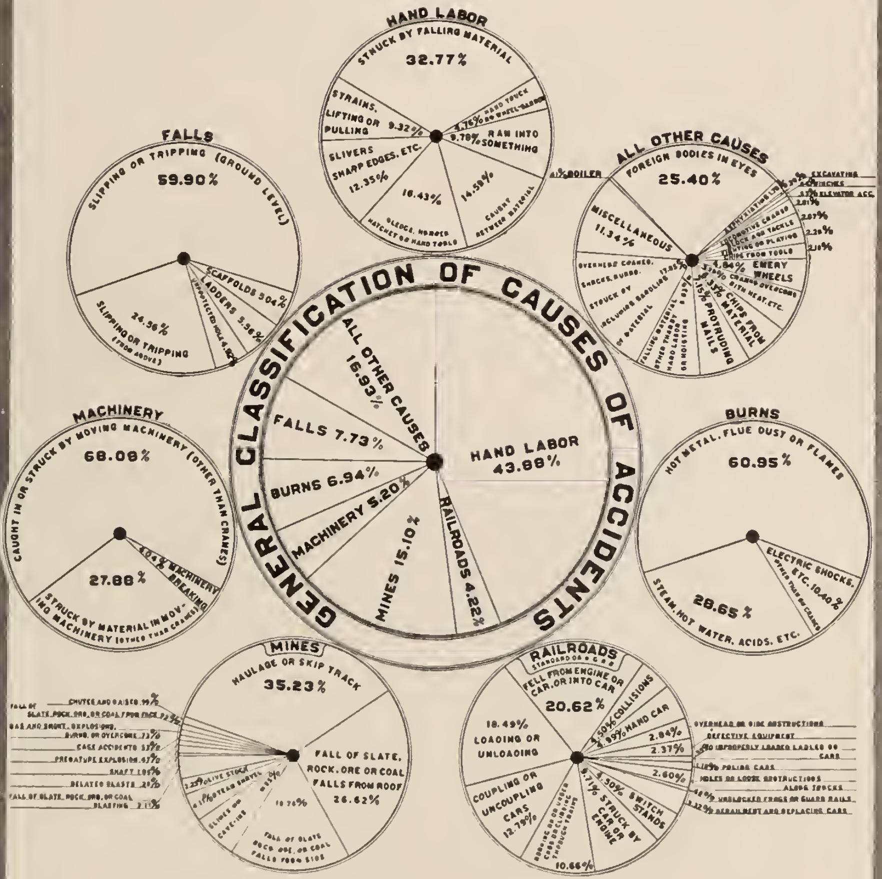
"In case of electric shock, break electric current instantly. Free the patient from the current with a single quick motion, using any dry non-conductor, such as clothing, rope or board, to move patient or wire. Beware of using any metal or moist material. Meantime have every effort made to shut off current.

"Attend instantly to the victim's breathing. If the victim is not breathing, he should be given manual artificial respiration at once.

"If the patient is breathing slowly and regularly, do not give artificial respiration, but let Nature restore breathing unaided.

"In gas cases give oxygen. If the patient has been gassed, give him pure oxygen, with manual artificial respiration.

70,702 ACCIDENTS CLASSIFIED AS TO CAUSE



UNITED STATES STEEL CORPORATION
BUREAU OF SAFETY SANITATION & WELFARE

"The oxygen may be given through a breathing bag from a cylinder having a reducing valve, with connecting tubes and face mask, and with an inspiratory and expiratory valve, of which the latter communicates directly with the atmosphere.

"No mechanical artificial resuscitating device should be used unless one operated by hand that has no suction effect on the lungs.

"Use the Schafer or prone-pressure method of artificial respiration. Begin at once. A moment's delay is serious.

"Continue the artificial respiration. If necessary continue two hours or longer without interruption until natural breathing is restored. If natural breathing stops after being restored, use artificial respiration again.

"Do not give the patient any liquid by mouth until he is fully conscious.

"Give him fresh air, but keep his body warm.

"Send for the nearest doctor as soon as accident is discovered."

A limited number of copies of the report may be obtained free from the Bureau of Mines, Washington, D. C.—*West Virginia State Board of Health Bulletin.* January, 1915.

◆

The Tragedy of Unemployment.—During the past winter we have had an opportunity of seeing the havoc that can be caused by "poor times" or lack of employment. That there is an effect upon the public health may be evinced by the following from the January Toronto *Health Bulletin*:

"There is evidence in many directions that the tremendous amount of unemployment at present existing is steadily undermining the health of the people. This lack of employment, with its consequent poverty and destitution, brings about lowered vitality in its victims, weakens their resisting powers and lessens their immunity to desease. And more than health is undermined as a result—for many of those who are forced to become charity cases, because of unemployment, never become self-respecting citizens again: they will have received charity too long.

"The cases which are constantly being brought to our notice, and which are the most pathetic of all, are those of self-respecting citizens who have never received or asked for aid before, and who would indeed in many instances rather starve than receive alms."

Trachoma as an Epidemic Disease.—An article by J. M. Woltz in the January number of *Safety Engineering* summarizes the experience of the Youngstown Sheet & Tube Company in handling an outbreak of trachoma and demonstrates clearly both the need of trained health officers for every community and the need of supervision of the health of employees by every large concern.

It will be remembered that the cause of trachoma is not definitely known, although it is admitted that it is an infectious disease capable of being cured. Under some conditions only an operation can bring relief and blindness is estimated to occur in about 75 per cent. of untreated cases.

In September, 1913, a patient who came to the Emergency Hospital at East Youngstown was found to have trachoma. Two weeks later two more cases were reported. Examination of the living conditions of the patients disclosed so serious a menace to the health of the Company's employees that leaflets were distributed describing methods of prevention of the spread of the disease.

Finding the disease to have originated outside of the factory the Company placed the matter in the hands of the local health board but because of its poor organization no help was forthcoming. The State Board was appealed to and sent two physicians to East Youngstown who examined the cases and recommended treatment. The treatment was not complete, however, and the cases were released too soon. The United States Public Health Service was then asked for aid and sent a specialist to the town to make a systematic study of conditions. A report was soon made concerning the best methods of treating the disease and the sanitation of the town. The local health officer was a layman without the training in sanitation to enable him to cope with the situation. And since the unsanitary conditions were resulting in the gradual spread of the disease and since the Youngstown Sheet & Tube Company were vitally interested in the problem it was recommended that this Company establish a hospital for treating the disease and adopt a systematic procedure for bettering the sanitary conditions. This they did and a special physician and nurse were employed. The cases were segregated and the proper treatment administered. The local health officer gave his assistance in putting the plan into operation and it was agreed that the township should pay its share of the expense should it ever become able to do so.

The results were most gratifying. The hospital gave 13,183 individual treatments to the 242 patients admitted and, in every case but one, a portion of the patient's sight was preserved. The hospital was opened from February to August 1914 and a strict watch of all employees is still maintained to see that no new cases arise. It seems that the whole incident might have been avoided had suitable public health administration been in force at the time of the first case.

⁂

Safeguards Elevators.—The American Museum of Safety has announced that the Scientific American Medal for 1914 is awarded to Glenn S. Williamson, for the invention of a safety device for elevators. The simple pressure of one lever by the foot of the operator, insures three conditions:

(1) Holding the elevator car immovable at a safe landing while the gate is open.

(2) Locking the gate shut before the car can be moved up or down the shaft.

(3) Keeping the gate shut and locked when the car is away from the landing.

⁂

Safety in Good Lighting.—In a very good article in the *Engineering Magazine* for March, 1915, G. H. Stickney summarizes the good effects of proper lighting.

"Good artificial illumination," he states, "can be furnished in such a factory for eight hours a day at a cost equivalent to about five minutes of the time of the workmen benefited. This illustrates the extravagance of poor lighting."

He calls attention to and treats independently the two phases of safety presented by good illumination, namely the prevention of accidents and the preservation of sight.

He discusses the effects of glare, improper distribution and unsteady lighting; contrasts "general" and "localized" lighting systems, and shows under what general conditions the two systems, singly or in combination, are to be preferred.

Inspection Important.—The Bureau of Labor Statistics and Factory Inspection of the State of Washington in a report of 1913–1914, in commenting on the Factory Inspection Law after a thorough trial, recommends the broadening of its scope. The large number of accidents happening in the 300 logging camps of the state is pointed as an important argument in favor of the broadening of the scope of the present law.

Factory inspection, it also points out, is now becoming a profession—and deplores the fact that the Washington law provides that not more than $4.00 per day can be paid to inspectors—a wage which is "perhaps the lowest paid for such work by any state in the Union."

There is not so much need of a stringent law as there is of rigid and *intelligent* inspection—and the Bureau desires a provision by which high-class inspectors can be secured.

⁂

The Federal Compensation Bill.—The Kern-McGillicuddy bill now before Congress is intended to provide more adequate compensation to civil employees in the United States. At present, although employees are unable to sue their employer, only one-fourth of them are protected by a compensation law. The present bill covers all civilian employees of the United States and the Panama Railroad. Since this bill includes a large clerical service it is obvious that the increase in accidents will not be comparable to the increase in the number of persons affected.

Compensation upon the basis of $62\frac{2}{3}$ per cent. of wages is paid from the fourth day after disablement whereas under the existing law a wait of fifteen days is followed by a payment of full wages from the first day. Medical supervision and machinery for encouraging the means for the prevention of accidents are provided and a commission is established for the administration of the act.—*Survey*, February 13.

⁂

Child Labor.—The August *Child Labor Bulletin*, prepared by the National Child Labor Committee, contains reports of children at work on men's clothing and of child labor in the glass industry.

The latter report states that: One in ten of all wage-earners in the one hundred and seventy-nine glass factories studied by the United States

Bureau of Labor was a child under 16 years of age. Since the investigation covered three-fourths of all the establishments, more than three-fourths of all furnaces, and all but four of the twenty-one states manufacturing glass in 1907–1908, its findings may be accepted as typical of the industry at the present time.

The report answers the following questions:

1. What were children doing in the glass factories?

2. What opportunities for training and advancement awaited them in the industry?

3. What was the attitude of the glass industry toward their employment?

4. How young were the children and what should be the legal restrictions upon the employment of minors in glass factories?

Of 3,615 boys under 16 years of age, 262 were less than 14 years old; of the 481 girls under 16 only 15 were under 14 years.

The greater proportion of these are working under conditions of high temperature and may be subject to great changes in temperature. Their chances for advancement are indeed small, their salary small and the regular hours worked by the boys corresponds in general to the hours of the skilled workers, which are approximately 50 hours per week on the night shift and 50 hours or less on the day shift.

⁂

A Definition of Safety.—The following is an abstract of an address made by F. R. Hutton, vice-president of the Museum of Safety and printed in the December issue of the Bulletin of the American Museum of Safety.

"Safety may be defined as a condition or state in which a man or a thing is shielded from harm. A safety device is an apparatus or appliance which shields or protects a man or a thing from harm or injury. A safety process is one in which the normal functions operate without harm or injury to those who labor in connection with it, and without risk of harm to the innocent bystander engaged in his usual occupations or avocations."

There is then a twofold philosophy in regard to Safety. Such philosophy is economic in the first place and humanitarian both in the first and second places. Consideration of the economic significance of safety in industry involves that:

1. The tool or device or process must work continuously to be profitable in competition. It must therefore not be liable to injure itself or to be held up from production because of accident which calls for repairs.

2. Its accident when it happens (and it is sure to, first or last) must not injure the operator, nor in the case of transportation apparatus such as cars or elevators, the passengers or the bystanders. The disability of the skilled operator stops production and entails loss.

3. The compensation of the injured employee increases cost of production. It therefore raises the selling price of the article produced and thus increases the "cost of living."

4. If death results from the accident, the community as a whole bears increased expense in taxes, in pensions, and in an over-weight of consumers in comparison with economic producers.

The second point of view, which is also logically the first, is the humanitarian point of view. The accident or harm to the person is due to his being exposed to a wounding or disabling mechanical force which the soft tissues or fragile structure of the human body could not withstand; or the harm is from the poisonous fumes or dusts of the trade which lead to a gradual breaking down of healthy tissues or normal bodily processes. This latter is a slow assault upon health and therefore upon wage-earning capacity. In the first group the thinking for safety will be directed to find and install the true accident-preventing devices, in the second group are all the safeguards against breaking down of lung tissues or the functionings of the vital organs; the prevention of asphyxiation, paralysis, blindness, ulcers, and infected wounds.

In the group to which the title municipal may be applied will be found the methods of securing safety where joint action of many individuals has to be secured. This means the attainment of safety in the crowded thoroughfare; in the elevator; on the street-railway or subway; and in the theater or place of amusement or education. These are the problems of the skilled handling of traffic; of well-planned rules and their wise enforcement for the guidance of the public; of fire drills and panic-preventing exercises.

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THE PLACE OF MOUTH HYGIENE IN THE PUBLIC HEALTH MOVEMENT.

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Secretary-Treasurer, The National Mouth Hygiene Association.

Paper presented before Joint Session American Public Health Association and the National Mouth Hygiene Association, Jacksonville, Ala., December 2, 1914.

THE brief amount of space allotted for the presentation of my subject prevents giving in detail the history of the oral hygiene movement of this country from a dental standpoint.

My first insight into the ravages that dental caries was making upon the American people came to me in 1888. I had been reading law for a year and a half and the close confinement had affected my health. Upon the advice of a physician I sought employment which would for a time take me away from my studies.

I obtained a position which brought me in contact with the members of the dental profession and their patients. It was here that I learned that thousands upon thousands of people were losing their health because of two things:

First: Because they did not know how to care for and use their mouth and teeth.

Second: Because they were afraid of dentists.

Although but a law student, I soon came to notice that the people who had mouths full of diseased or neglected teeth were decidedly below par physically.

It occurred to me that if a man should educate himself with a view of teaching the people how to properly care for and use their mouths and then teach the dental profession to use humanitarian methods in the treatment of dental lesions, there would be a greater field for benefiting humanity than in any other work.

From that day to this I have been preaching and teaching mouth hygiene to the general public and humanitarian methods to the dental profession.

When I began to associate with the members of the dental profession I found the dental men severely criticising the medical men for failure to recognize the importance of the service the dental men were rendering.

When I became a physician and a dentist I maintained that the only way to secure recognition was to prove the value of dental service as related to the health problems of the country.

When I entered the profession there was little or no thought being given to the prevention of dental caries from the scientific standpoint. Almost the entire energy of the dental profession was confined to correction of the faulty conditions brought about by dental caries.

I have been unable to ascertain where oral or mouth hygiene first originated. When I came into the profession in 1897, Dr. D. D. Smith of Philadelphia was teaching oral prophylaxis.

Cleveland Takes First Step.

In 1898 the Cleveland Dental Society made an effort and succeeded in having some dental instruction introduced into the Cleveland public schools; but the methods employed were rather crude and the results of but little value.

The first definite and successful result in establishing a dental clinic or free dispensary of which we have any record was in Rochester, N. Y., and in so far as we have been able to learn this city is entitled to the credit for the first permanently successful efforts along this line.

The first successful effort made by an individual to have mouth hygiene given recognition from a national standpoint was made by Dr. Richard Grady of Annapolis, Md., before the National Dental Association in 1899, when he succeeded in having an oral hygiene committee appointed by that organization.

For five years Doctor Grady and his committee labored faithfully, receiving but little recognition and making slight impression upon the members of the dental profession who were more interested in correcting conditions than they were in prevention.

Doctor Grady was succeeded by Dr. John P. Corley of Sewanee, Tenn., who served for five years as chairman of the oral hygiene committee of the National Dental Association, receiving recognition and consideration for his movement which would have discouraged even an optimist, and was finally succeeded by the writer, who put in four years of the stormiest time of his life in attempting to place mouth hygiene in its proper relation to the health problems of the country.

Mouth is Body Gateway.

I took the position that the mouth, the gateway to the human system, was the most important organ of the body, when it came to dealing with health problems and that it wields a greater influence upon the health and welfare of the individual than any other organ of the body.

While I expected a great wave of protest from my brothers in the medical profession, it will interest you to know that the most severe criticism of the stand taken came from members of the dental profession.

We were called most everything that the ingenuous mind could lend tongue to for the position we had taken, and as a matter of self-defense undertook to prove not only to the dental profession but to the world at large the relation that the proper care and use of the mouth bears to the health, strength and working efficiency of the individual.

You will notice that I use the terms "proper *care*" and "proper *use*" of the mouth. It will be of interest to you to know that it fell to the lot of a layman to prove to the world at large the value of properly *used* mouths. I refer to Mr. Horace Fletcher, the president of the National Mouth Hygiene Association during 1911–14, who at the age of 40 was a physical wreck, refused by the insurance companies as too great a risk, by the proper *use* of his mouth, together with the selection of food stuffs, became at the age of 60 a man able to double the tests of strength and endurance made by the best athletes in the leading colleges of the country.

Medical Man Pioneers Way.

It was, however, a medical man, Dr. W. A. Evans, our first vice-president, who at that time was commissioner of health in the city of Chicago, who brought to the attention of the dental and medical professions in a forceful manner something of the importance that carious teeth bore in the spreading of disease. It remained, however, for a dentist to conduct experiments upon the result of which might be based some idea of the value of healthy, well-cared-for and properly-used mouths to the individual.

As chairman of the oral hygiene committee of the National Dental Association, I directed that examination should be made in the various sections of the country to find the percentage of mouths of public school children of this country that were diseased or in a faulty condition. These examinations were made in the various parts of the United States and it was found that from 96 to 98 per cent. of the mouths of the school children were in imperfect condition.

Having ascertained the extent to which school children were affected by dental caries or other lesions of the mouth, we undertook through the co-operation of the National Dental Association, the Ohio State Dental Society, and the Cleveland Dental Society, to conduct a series of experiments which would demonstrate the benefit to be derived to the individual from correction of faulty conditions and teaching the proper care and use of the human mouth. Forty children were selected as having the worst oral conditions from 398 pupils in the fourth, fifth, sixth and seventh grades in Marion school, Cleveland, Ohio, a school having an enrollment of 846 pupils. In selecting these children a careful and complete examination of the mouths was made and the history and class record of the children for six months before the treatment began. Two sets of psychological tests were made at the beginning of our experiments to prove the actual working efficiency of the children at the time they were received for care and treatment. They were given full and complete instruction on how to care for and use the mouth and a nurse was placed over them for the purpose of securing their coöperation in the work we were undertaking, and dental service was furnished to correct all faulty oral conditions.

CONDUCTED MANY EXTENSIVE TESTS.

The majority of these children were repeaters and many of them were kept in school only by the activity of the truant officer. Two special meals were served to these children for the purpose of teaching them how to properly use their teeth, and following the meal they were instructed how to properly care for their mouths. Of the forty children selected, five were dropped the first day because they would not agree to perform the duties which were required of them; and during the year's experiment eight more were dropped because of the failure upon their part to carry out the instruetions given.

A remarkable showing was made as a result of these experiments. From the first of June, 1910, to the first of June, 1911, there was not a single case of illness of any member of the class. The school records, efficiency, attendance, conduct, and physical appearance showed wonderful improvement, while from a psychological standpoint the mental tests showed an average improvement of 99.8 plus per cent. for the 27 children finishing the work.

Do not misunderstand this statement. We said that the psychological tests showed an average increase in mental working efficiency for the year of 99.8 plus per cent. We did not say that this increase was due to the correcting of faulty conditions of the mouth, in other words the filling and cleaning of the teeth; nor did we say that this improvement or increase in working efficiency was all due to correcting oral conditions and the teaching of the proper care and use of the mouth. A part of this improvement was due to the natural growth and development of the children; but, by far the greater part of the improvement was due to the correction of the faulty conditions found, and the teaching of the proper care and use of the mouth.

"CARE" MEANS PROPER CLEANING.

By *care* we mean proper cleanliness, hygienic conditions. By *use* we mean the selection of suitable food stuffs and the proper manipulation of them while in the oral cavity, so that the best possible results may be brought about.

The showing made by this class was startling indeed, and the greatest shock was felt by the dental profession, which for the first time received definite proof of the importance that the mouth bears to the health, strength and mental efficiency of the individual. The importance the mouth, then, bears to the general physical condition of mankind, entitles it and those who are devoting their lives to its needs, to a full recognition and consideration by those organizations, municipal, state and national which have to do with the physical welfare of the human family.

Every organization which has health for its consideration, should have not only in its council, but in its inspection department as well, members of the dental profession. And, in our judgment, those organizations which are the most progressive and successful in the handling of public health questions, will have the dental profession well represented on their staff of workers.

Think not that there is no need for dental representation in connection with health boards of bureaus; and think not that the medical men can successfully handle this important phase of hygiene and sanitation, for such is not the case. Conditions are so appalling, lesions so distressing and the physical condition so impaired by faulty oral conditions that public health activities must be supported by dental activities of the most forceful kind in order to produce a psychological impression which will, in a measure, lead to a full understanding, by the individual, of the obligations and duties he must perform in correcting faulty conditions in public health.

The people must be taught to know and do those things which will produce and maintain perfectly healthy oral conditions; and to accomplish this at this time the dental profession is essential and must fulfill its duty and its obligation if humanity is to come into its own.

The time is coming when medical men will wield sufficient influence to bring about a correction of faulty oral conditions, but now when the human mouth is the most neglected and ill-kept organ of the body, medical and dental men must combine and operate under the most ideal circumstances if the greatest good is to come to the greatest number and come to the present generation.

Let me call your attention to a few facts that have been long recognized but little understood. For years the physician has asked to see the tongue and the throat in diagnosis. Each carries its message, but the story has been only half understood.

The coated tongue, for instance, tells a story; but to the physician it is of things that lie beyond the tongue that it speaks, and not of the condition of the tongue itself. The coated tongue tells of lowered resistance and by its appearance may tell something more. But, what makes this coating? What is it? It is *microörganic life* that lowered vitality has permitted to multiply in such numbers that the whole mouth is filled with them and the tongue with its rough surface forms the best lodging places for them.

GETTING BACK TO CAUSES.

We have come to recognize something of the influence the mouth has on health. Kissing has been tabooed—except on stated occasions; the individual communion cup has been adopted by the church; the public drinking cup has been forcibly discarded as an abomination; and anti-spitting ordinances have been passed in all our large cities. So far, so good. But what of the coughing, sneezing, singing, talking, yes, even the smoking public, with ill-kept and uncared-for mouths, from which when in action, millions upon millions of micrcörganisms are sent floating out upon the air.

Stop kissing if you can, arrest the spitter if you will, prohibit the public drinking cup if you must. Do these things and you have made progress; but, to give to humanity that to which she is entitled from a hygienic standpoint you would have to place gauze muzzles on over 90 per cent. of the people. We muzzle dogs to avoid one kind of disease. Why not muzzle men to avoid the many other kinds of diseases? It might be ideal, but hardly practical.

But to turn from jest to earnest. We have made progress in preventing the transferring of many microörganisms from individual to individual, but much remains to be done here. What have we done for the individual whose faulty mouth is a serious handicap?

Most of the efforts thus far have been made toward preventing the spreading of diseases, with practically no effort made to remove the cause. The diseased individual has been given no thought or consideration. We have not been concerned with his physical welfare.

Our method of dealing with diseased mouths has been about on a par with the activities of an officer who upon learning that a dog affected with hydrophobia was loose in the neighborhood, spent his time in warning people to keep off the street, to keep children in the house, and their dogs chained up; making every effort to keep people and animals from coming in contact with the diseased dog, but making no effort to destroy the diseased animal. We have been laboring to avoid an effect without removing the cause. The National Mouth Hygiene Association's plea is for the removal of the cause, and the effect will take care of itself. Let us deal with the mouth of the individual both in his interest and in the interest of humanity at large.

What the mouth means to the individual has been told in a measure by the experiments on the Marion school class. What has been done for the individual can be done for the public at large. It is ours, then, to teach and preach the power and influence the mouth wields for good or for evil.

TESTS MADE WORK POSSIBLE.

Having ascertained the frequency with which diseased or faulty mouths were found among the American school children, and having through the Marion school experiments demonstrated something of the value of correcting these faulty conditions, we were prepared to go before the world at large with something tangible in support of our statement that the human mouth is the most important organ of the body in dealing with the health problems of the country, and that it is the least considered and most neglected of all the organs of the body.

Learning these things we undertook through the organized dental profession of this country to teach the general public the importance of mouth hygiene, but met with only a small measure of success.

It was then we came to know that if the importance of mouth hygiene was to be impressed upon the American people it must come not through dental organizations alone, but through an organization which would permit all professions and all laymen to unite and coöperate in the spreading of the mouth hygiene propaganda.

It was with this end in view that the oral hygiene committee of the National Dental Association sought and obtained the approval of the National Dental Association for the creation of the National Mouth Hygiene Association, an all-professional, all-lay organization, which was organized July 28, 1911; an organization which during the last three and a half years has accomplished more in spreading the mouth hygiene propaganda and demonstrating to the American people the value of healthy, well-cared-for and properly-used mouths, than all the dental organizations in the country working alone as dental organizations had been able to accomplish prior to this time.

TEACHING MOUTH HEALTH.

Many have misunderstood the work the National Mouth Hygiene Association has undertaken to accomplish in the interest of humanity. Many have thought that its teachings were confined to dealing with those things which pertain to the mouth alone. Such is not the case.

The purpose of the association has been to teach health, devoting its main efforts toward placing oral health or mouth health in its true relation to the general health problem.

Having ascertained the ravages that faulty or diseased mouths were making upon the health and working efficiency of the American people, and having learned that there were not enough dentists in the United States to take care of the people in New York city alone, those who were directing the mouth hygiene activities of this country came to know that the only possible chance of combating the ravages of dental decay was by beginning with the infant and teaching that line of procedure which would prevent dental caries.

It has been proven that a clean tooth seldom decays. Therefore cleanliness was the first law to be laid down by the National Mouth Hygiene Association.

It has also been demonstrated that an idle or lazy tooth succumbs more readily to decay than do the teeth which are used in mastication of food. Therefore the association has come to teach the care and use of the teeth.

The work of the National Mouth Hygiene Association is to teach "How to Care for the Mouth" and "How to Use the Mouth," also the kind of preparation to be used in cleaning the teeth and mouth and the kind of food to be used giving proper exercise.

Discussion.

Dr. W. A. Evans, *of Chicago:* The dental profession grew out of the medical profession, and by reason of the fact that a group of men caring for teeth had developed the art side of their science so that they became engrossed in the art of dentistry; that had its very great advantages, it also had its disadvantages. Its great advantage was that it led to the perfection of that art, and its disadvantage was that it led those men away from contact with the general medical profession and also that it led the mind of the general medical profession away from consideration of the teeth in their relation to the development of disease. We are beginning to understand that a very large part of the infections with which men suffer find entrance to the body through the mouth and nose; the great majority are there found. We have been disposed to put, I think, in the development of this idea, rather too much stress upon the nose as the focus of infection, upon the tonsils as the focus of infection, and, relatively speaking, at least, too little stress upon the teeth as the foci of infection. Most of the cavities of the body have the capacity of readily cleaning themselves. The nose can clean itself fairly well, not so well as other parts of the body, but least efficient in this particular are those structures we know of as the teeth, less efficient than the tongue, the incapacity of which for self-cleansing was alluded to by Doctor Ebersole. I believe that we are on the verge of the discovery that so far as these enemies are concerned, rheumatic affections and perhaps a considerable other large group of diseases are concerned, that infections with organisms that are found around and in the teeth are of very great importance.

Dr. George M. Kober, *President of the National Society for the Study and Prevention of Tuberculosis:* The subject of mouth hygiene, I think, acquired peculiar significance during the last two or three decades when we acquired some definite knowledge as to the spread of all infectious or communicable diseases. It was one of our American investigators, General Sternberg, who first discovered, I think in 1883, that the mouth, that is, the buccal secretions of the mouth, frequently contain some very virulent organisms capable of producing septic conditions when injected into animals experimented upon, He practically discovered at that time, though quite innocent or ignorant of its real effect, the ethological factor of pneumonia. He was the first to describe the pneumo cocus, but finding an organism in his own mouth and being perfectly healthy as he was, he did not dream for a moment that that was the real cause of pneumonia until it was demonstrated a year or two afterwards by Professor Frankel; the very organism that Doctor Sternberg had recognized in the buccal secretions of his own mouth and found in a very large percentage of perfectly healthy persons, was the real cause of pneumonia. Since then, of course, we have been impressed with the great elements of danger that may lurk in the mouth, especially when the mouth happens to be the seat of carious teeth. It has been demonstrated over and over again that the very cracks and crevices which are formed in the enamel practically afford suitable lurking places for microörganisms where they undergo rapid multiplication and bring about destruction of the teeth, and by gradual absorption of poison from these very lesions, are liable to result serious internal intoxications referred to by Doctor Evans. They are the result of toxins absorbed primarily in the buccal cavity and poisoning the blood to such an extent as to cause serious lesions elsewhere.

He might have referred to the work of Doctor Collins, the celebrated neurologist, who has presented evidence that a large number of what were formerly considered functional affections of the nervous system are really organic in their character and owe their origin to toxin absorption resulting from diseased teeth. I merely want to throw out to those specially interested two suggestions. After all, what is the primary cause of decayed teeth? I am old-fashioned enough to believe that our mode of living has a good deal to do with it, and I believe that the abandonment of our whole cereals had a great deal to do with weakening the power of resistance of the teeth and inviting premature decay. In other words, I believe that the outer membrane of rye and wheat contains certain chemical substances that are absolutely essential and definitely necessary to impart that degree of hardness, that power of resistance of the enamel in order to prevent anything like fissures and cracks upon the slightest provocation, and I believe it will be very wise to really resort to more primitive methods of consuming our cereals for that reason. The second and a very important predisposing cause is our pernicious habit or rather our habit of resorting to the pernicious ice pitcher, particularly during the abrupt changes at meal time, the abrupt changes from heat to cold are very apt to produce cracks or fissures, and when once a cracking of the enamel is established, as I said before, the microbe has a suitable lurking place and produces destructive effects.

Dr. Oscar Dowling *of Louisiana, Vice-President of National Mouth Hyjiene Association:* Four years ago the Boston Hygiene Association gave out the statement that 95 per cent. of the school children had defective teeth. I could not believe it, and the first school I went to after that, I asked the principal that I might have the privilege of making a personal inspection of the children's teeth, and out of one hundred children whom I examined that morning, I failed to find one that had perfect teeth, I could discover some slight defect in the mouth of every child whom I examined. I urged upon them the importance of using a toothbrush, endeavoring to teach them how to use it, and told them to buy five cents worth of chalk and use a stiff toothbrush as a dentist had told me, because I wrote to a hundred of them asking for advice along this line, to use the brush on the lower jaw by working from the lower up and around from the upper teeth down. It was rather surprising to see the demands made on the local stores for toothbrushes. I would ask the children "Have you a toothbrush at home?" And they would invariably say "Yes," I told them I was satisfied they didn't use it. The next morning I went into one of the stores and asked the man if he had a toothbrush. He said, "No," that he had five dozen on hand but in some way had sold them all the evening before. He told me that on the strength of this demand, about a month later he had ordered a large number of toothbrushes, but the people had quit buying them. I made another visit to the school and could easily detect that they had not been using the toothbrush. They insisted they had, but the evidence was against it. I have had a similar experience in different places in the state. I have attended dental associations and they have shown a disposition to co-operate in every way they can. In different places they are having free clinics where they examine the mouths of the school children, take those children to their offices and fill their teeth free of charge. Some have gone to a great deal of trouble in cleaning their teeth.

Through the kindness of Doctor Ebersole we learned of a film entitled "The Toothache" and have shown it in more than two hundred places in Louisiana. It pleases the children, reminds them of the fact that they should wash their teeth, and it shows them how, and we believe that it has been one of the best practical lessons that we could carry to the people of the state.

DENTAL CLINICS AS A COMMUNITY INVESTMENT.

EDWARD F. BROWN,
Superintendent, Bureau of Welfare of School Children, Department of Social Welfare, New York Association for Improving the Condition of the Poor.

Read before the Joint Session of the American Public Health Association and the National Mouth Hygiene Association at Jacksonville, Fla., December 2, 1914.

THERE are certain facts about school children, which owing to the frequency of their verification by scientific research, need hardly be amplified here. Briefly summarized, however, they are: That the vigor and stability of the commonwealth demand the most careful nurture of children; where the care, which ordinarily is the function of the parent, is neglected, owing to whatsoever cause, the state, in *loco parentis*, must exert its right to protect its wards against the havoc which is wrought through the neglect of their physical condition; health is an indispensable complement to a wise and happy state; the great menace of defective teeth is that the decay not merely attacks the local organ, which rots away, but evidences its destructive tendency in general devitalization of the body.

ORAL HYGIENE ESSENTIALLY AN EDUCATIONAL PROBLEM.

It is evident that parents are not awake to the serious consequences of neglecting the teeth of their children, or being awake, are ineffective in adequately attacking the problem.

The natural question which a discussion of this kind should provoke is, what shall be done about it?

To begin with, we are not of those who believe this to be an exclusively professional dental problem. It is rather, to my mind, primarily a problem of education. We doubt whether there are enough dentists in the world to treat all the persons in the world requiring dental care. We must base any action on constructive and preventive aspects, because it is quite possible that from that angle we shall reach the greatest number in need of attention.

The wide-spread infection of the teeth of school children is a particularly irritating problem, having its ramifications not alone in the dental health of the individual child but asserting itself in general physical disorders, the miscarriage of the educational economy, the imperfect preparation of the child for life, the general lowering of the vitality, rendering the plastic child especially susceptible to disease while impairing its prospect of future efficiency.

METHODS OF ORAL HEALTH EDUCATION.

There are two instruments with which we may approach this difficulty: The establishment of dental clinics for the free treatment of children whose parents are too poor to pay for private treatment, and the carrying forward of a vigorous educational campaign among the people in a simple form on the prevention of dental defects and diseases and the conservation of the teeth. A combination of both of these activities would be better than to emphasize one in favor of the other. Such a campaign should stress the fact that in addition to the agonizing pain which accompanies tooth rot, many frequently suffer serious disability which may often be traced directly to neglect of the teeth. We know now what is causing this widespread evil and how it can be cured. It is not enough that we should know this, but we should let those who need this information most learn of it, too.

We should begin, perhaps, with the children, incorporating in the school curricula theoretical and practical demonstrations of oral health. We must even go back a little and instruct teachers to demand of their children the same cleanliness of the teeth that is now demanded of the boots, face, hair and nails. Possibly the time will come when in each public school we shall have especially constructed basins where the children as they come in the morning will be called upon to brush their teeth in a proper manner as regularly as they are called to assembly to listen to a reading from the Bible or to sing patriotic songs.

The time will come when we shall teach children not merely the use of the toothbrush, but the use of dental floss and antiseptic washes and the need of periodic dental examinations. It is not enough to teach the child the theory of personal hygiene, but it should be supplemented by actual toothbrush drills under the supervision of a trained teacher. The daily repetition of such lessons will soon make of the lesson a habit without the performance of which the child will be quite unhappy.

Graphic exhibitions of bad mouths and good mouths, the proper method of oral sanitation, the function and uses of the teeth, their care and preservation, should all be thrown upon screens where the simplest folk can come and learn and go away benefited. Exhibits might be made of portable material and ought to travel from school to school where parents and pupils and teachers could come to view them. These ought to be supplemented by lectures. The potent influence of the illustrated lecture is not to be underrated. The exhibits, bringing home to parents the need of proper care, will soon, I believe, result in children being taken to the family dentist.

THE SCHOOL DENTAL CLINIC.

There is, however, a large group of children in this country whose parents are too poor to pay for such treatment, which is often expensive, and for those whose parents are ignorant or indifferent to their needs the extension of clinics such as are now established in New York, Rochester, Cleveland, and Philadelphia, etc., where necessitous cases receive attention, is essential in other cities.

It has been argued that the principle which provides for free treatment for physical defects of school children is not sound. This is based upon the reasons that it is not the duty of the state to provide such treatment; that it tends to pauperize the recipients; and that through indifference, poverty and neglect the causes of these unfortunate conditions arise; through public treatment a premium is put upon parental inefficiency and it tends to aggravate conditions by relieving parents of responsibility.

In answer, it is shown that the return in social efficiency incident to putting children in good physical condition more than offsets the cost of caring for the children later in life when the results of social neglect have accumulated and left them with chronic disorders. Much non-promotion is caused by loss of instruction due to absences from school resulting from illness of the school child. Neglected children are apt later in life to become unproductive citizens who must be taken care of by the productive units of society.

It has also been asked, should these school clinics provide treatment merely for necessitous cases, or should treatment be absolutely free? It is said to be economically unjust to tax the whole population for a service to a special class. The facilities to the support of which all contribute should be available to all. By the opponents it is claimed that it is no part of the function of the city to provide treatment of this kind; those requiring such treatment should be sent to the numerous hospitals and dispensaries which are supported by public and private funds; individual responsibility of parents might be brought home more directly by charging a nominal fee for treatment and cure.

On the other hand, it is argued that children whose parents can afford to pay for private treatment should go to private practitioners whose livelihood depends upon such professional service. School children with defects are probably retarded in their work. They themselves are not only the victims of this condition, but they also hold back other members of the class who are physically fit to go ahead but cannot do so without leaving the retarded ones behind. That is, the pace is set not by the brightest but by the poorest pupils. Investigation has shown that in the case of defective teeth there are so many poor children who cannot pay for treatment that unless clinical provision is made for them they will receive no attention whatever. Since tuition and books are furnished free to the pupils, the facilities whereby they may avail themselves of these benefits to the utmost should also be provided.

Such clinics should act not merely as mechanical repair depots where children are treated to go out and again neglect their teeth, but should be located in the schools, serving as centers for the dissemination of simple intelligence on oral hygiene. The clinic should confine itself to the treatment of children between six and eight years of age and should provide toothbrushes, mouth and tooth preparations at cost to school children. Dental treatment in the earliest stages frequently is without substantial pain and the lesson of oral hygiene is thus early inculcated.

Such clinics may set aside definite hours for consultation when pregnant mothers can come to procure advice on the care of their own as well as the teeth of the expected infant. Undoubtedly the irregular eruption of the second molars, which often results in disfiguring the face, is frequently caused by premature or imperfect extraction of the milk teeth. Much of this could be avoided if the care of the infant's teeth could be taught to the mother by such consultation service.

Another question of importance is the present vogue of indiscriminately using tooth powders and pastes. A popular fallacy which ought soon to be destroyed is that all of these preparations perform the same function. This is not so, for, as you can readily see, the same tooth preparation may react in entirely different ways in two different mouths. Probably such tooth preparations should be sold only on the prescription of a dentist.

Leaflets in the language of the predominating race of the district where the prophylactic clinic is located should be distributed on all matters relating to oral hygiene.

Prevention—A Newer and Important Science.

The philosphy of prevention in the oral hygiene movement will, it is hoped, take the place of the futile attempt to reach a large number of school children through repair clinics. But there are other phases of the prevention of dental defects and diseases which should appeal strongly to us; it is more economical to prevent than to correct defects; it is more humane; it will undoubtedly result in increasing the productiveness of many persons who because of the condition of their teeth are rendered inefficient.

Dental defects and diseases of the oral cavity evidence their destructive tendencies in many avenues of advancement, namely, the physical, mental, moral and social.

The crust of popular indifference behind which dental decay was entrenched has been broken through. Now that dental and medical research have discovered that malnutrition, anæmia, stomach ailments, facial neuralgias and scores of abnormal conditions frequently have their origin in unhygienic mouths, the dentist has been exalted as an indispensable agent of the public health movement.

Defective Teeth Blocks Effective Education.

An educational project must carry its complement of pupils; an educational order with physically imperfect pupils does not measure its complete utility. That is the situation we are faced with. If there are children whose home conditions are such as to make impossible the care of the teeth, and if society makes no provision for such care, we must be patient with the absence from school of such children, as they are in pain and are not merely incapacitated for performing school work but are disturbing agents in the orderly progress of the class. The children who for any reason remain from school miss the classroom work. Such lapses, occurring as they do now to a large body of our pupils, put them considerably behind in studies, which frequently eventuates in the failure of the child to move to the next class in a normal manner. The cost of the teacher, the school plant, books and the whole system, so far as that child—and there are over a half-million in New York City alone—is concerned, is without public profit. We are therefore obliged to provide funds in our educational budget for the reëducation of a large group of retarded children. Let us be specific.

During the first half-term of 1913, 189,840 of our New York city children were "left back." The semi-annual per capita cost of education here is $19.36. While it is not asserted that the lamentable condition is due to bad teeth, we cannot escape the conclusion that much of this retardation is due to absences which are the proximate cause of physical inability to attend school or to learn. Defective teeth being the most common of all the defects found among the children, the oral cavity must therefore assume its just share of the blame. The cost of reëducating these 189,840 children is $3,675,302.40. Does it pay any community to permit this waste to continue when the cause is so easily ascertainable and the solution so clear?

Rural oral hygiene must be fostered. As in other phases of social endeavor, the children in the rural schools are perhaps in a more precarious state than the urban children. This is due to their isolation and to the fact that there are fewer facilities for correcting such defects as bad teeth than in the city. Central clinics in schoolhouses seem feasible for the city, but in the rural districts we shall probably have to institute an ambulating clinic. Oral hygiene education, however, should receive special attention in country districts. Itinerant lecturers and exhibits do much to draw the attention of the people to the danger of neglecting this phase of health work.

PHYSICAL INCOMPETENCY CONDUCES TO ECONOMIC DESTITUTION.

Sickness, or physical degeneracy, more than any other single factor, it has been said, is the cause of social dependency. To enter into the uncertain struggle to maintain life in industrial society as at present constituted, at least two things are indispensable: 1. A sturdy physique; 2. Preparedness.

With numberless dental defects among our school children, we are denying them the first essential of social competency. The physical condition of the child which precludes the orderly educational process from functioning properly, conduces to a low degree of efficiency in preparing the child for the stern realities of life, thus depriving it of the second essential. These social denials make for social incompetency, which produces social dependency, waste and misery. The care of the oral cavity will undoubtedly help to reduce and prevent poverty; it will assuredly, in association with the other movements in this direction, do much to check the possibility of destitution overwhelming the man who is sturdy of body and sound of mind.

Discussion.

DR. DONALD B. ARMSTRONG: The amount of dental decay in New York City is indicated by the following figures:

In 1913 the medical inspectors of the Department of Health found 194,207 cases of dental defects among school children. However, only 37.3 per cent. of the school enrollment was examined that year. Assuming the same ratio of defects in the unexamined children there would be apparently about 524,000 cases of dental defects in the city schools. This means that 59 per cent. of the school enrollment is in need of dental care.

How adequate are the facilities in New York City at the present time for handling this situation? In 1913, of the 69.7 per cent. of children found in need of medical aid, only 23.8 per cent. is reported as having been treated. This work was done by six dental clinics caring for 3,970 patients, giving 28,239 treatments. There are at the present time nine dentists employed in New York City at a salary of $1,200 who work three hours a day, and there is one supervising dentist receiving $1,500. These six clinics are all located outside of school buildings.

Now in order to determine just how adequate, or rather inadequate, these facilities were the Bureau of Welfare of School Children of the Association for Improving the Condition of the Poor made a survey of the situation, attempting to ascertain the efficiency of the present treatment, the actual number of defects, the possible use of private hospitals and dispensaries, the possible maximum use of the free clinics and of any private facilities. I present these details because such an outline might prove useful in other cities.

On a basis of the results from this study our Bureau asked for nine additional clinics and dentists and was successful in getting this request into the Department of Health budget. It meant an additional expense of about $27,000 for equipment, supplies and professional service. In this work the Bureau had the most useful coöperation and advice of the First District Dental Society of New York City. This Society met with our Bureau, held and adopted the following principles, to which it gave hearty support:

1. That it will support the modest request for nine additional dental clinics as outlined in the proposal of the Bureau.
2. That the dental clinics be established in school buildings.
3. That the clinics be open from 9 to 5, with two shifts of dentists, each working half time.
4. That the supervising dentist, for adequate compensation, devote his entire time to the work.
5. That the clinics should extract, provide plastic fillings, and clean teeth only.
6. That the Bellevue equipment be utilized for the surgical work.
7. That the dentists be paid $1,200 a year for half-time work.
8. That a system be devised whereby the work of the dentists be checked up to insure efficient treatment of each school child.
9. That the clinic concentrate its work on the children between six and eight years of age.
10. That the treatments be absolutely free.
11. That, while the two-chair clinic has advantages over the single-chair clinic, for the

present it is wise to organize nine additional single-chair clinics and subsequently, if it be deemed wise, equip these nine stations with additional chairs.

12. That the school clinic provide toothbrushes, mouth and tooth preparations at cost to school children.

Unfortunately, because of war retrenchments, the Board of Estimate refused the Department's request for additional dental clinics this year. On the other hand, we were successful in getting two additional medical inspectors, eight additional nurses, two nose and throat surgeons and one full-time medical inspector. This increased substantially our facilities for discovering defects but it is the remedial mechanism that most urgently demands expansion.

Our propaganda for dental clinical expansion will be renewed next year and with better hopes of success. Its failure up to the present time is not the result of a lack of an active and public-spirited dental profession. The lack of increase in dental facilities is not the result of an inferior Department of Health in New York City, under which Department this work is carried on. New York City has at the present time the best health administration we have ever experienced. What we lack and what is necessary before this program can succeed is an intelligent general public opinion which shall insist that those in public office be authorized to spend a paltry $27,000 to prevent physical defects among school children so as to decrease the $3,600,000 now spent annually to reëducate defective children in New York City. It is the principle of prevention that must be taught and the false economy of ineffectively curative and palliative measures in social organization.

Dr. G. W. Goler, *of Rochester:* I am very glad to hear this paper, because we in Rochester have been for a long time interested in this matter of mouth hygiene. We have four dental chairs that are free or comparatively so, and of those four chairs, three of them are in school buildings. We make our dental inspection a part of our medical school inspection, that is, the dental inspection is carried on by the medical school inspector, and wherever he finds a child with defective dentition, that child is referred to the nearest school or, as in the case of one of the associated health organizations, a free dental clinic; and then we also have follow-up work. The school nurse takes care of that follow-up work and endeavors, as far as she can, to provide that these children are looked after systematically. Of course, as has been said by some of the other speakers, it would be almost impossible, even if we had our dentists multiplied by four or five, to take care of all the dental work that needs to be done for school children. We then take up dental inspection when the child comes for its paper to go to work. There we found a very strange condition of affairs. We found among the South European children, particularly among the Italians, that about 80 per cent. of those children at 14, when they came for working papers, had microscopically or to the ordinary observer, perfect teeth. We found of our own children, and the children of North Europeans, that about 90 per cent. had imperfect teeth. I am rather inclined to agree with what Doctor Kober said about our getting away from a coarse diet and about that in some way having something to do with the decay of the teeth. Some of us eat graham bread, part or all of the time. We forget the fact that old Graham, sixty or seventy years ago, was really preaching a kind of doctrine. He preached this doctrine throughout our section of the country, that the only thing you had to do to preserve the teeth in children as well as adults, was to eat graham bread. That statement is borne out by some of the very interesting investigations that were undertaken in Africa at the time of the building of the Assouan Dam on the Nile. A great many of the older cities, of thousands of years ago, were to be inundated by the waters of this dam when the Nile was dammed back, and the British Government, coöperating with the Egyptian Government, sent out a Commission of scientists and took out from the neighborhood of the Nile 5,000 or 6,000 bodies varying in age from 3,000 to 5,000 and sometimes 6,000 years old. They found a very curious condition of things. They found that the aristocrats had decay of the teeth, just as our aristocrats have decay of the teeth, but they found among the proletariat and particularly among the children of the proletariat, that decay of the teeth was just as rare as decay of the bones. When those people began to examine the intestinal contents of the stomachs of these people, they found that not only about their mouths but in their intestinal contents, mixed with food, was a considerable quantity of sand. They could also find in the mouths of these people considerable quantities of sand. You may say that that sand got in there accidentally. It doubtless did get into the mouth accidentally, but it did not get into the stomach or the digestive tract altogether accidentally. In all cases they found that these teeth, while they practically did not decay at all, were simply ground in the older people until the crowns of the teeth were almost on a level with the gum-line. This is some evidence at any rate, that coarse food, mixed with sand, may have something to do with the prevention of decay of the teeth. (Applause.)

Dr. Roger Perkins, *of Cleveland:* I have been very much interested in this paper. In Cleveland we have made certain starts in this line, and although I am in no way connected with it as a teacher of hygiene, I am very much interested in anything that has a bearing on the line of prevention. It has been established that the relation of health and the much-abused term, efficiency, is extremely close, and all we have to do is to establish that any definite condition is an interference with health, to establish that it also must be an interference with the best results we can get out of the race or any part of the race, and also to follow that up by showing that any interference with health at the formative period of the race in childhood is likely to have more far-reaching results than those occurring in adult life. The only way we have of finding out whether a thing is important or not is by investigation. If we do decide that it is important, we then have to carry the matter on by education and when necessary by treatment or something analagous, the result of various bacteriological work of one sort or another, and the subsequent education of the families, has been very clearly shown in the general attitude of the children nowadays toward the use of the common slate pencil or toward the distribution of chewing gum, apples, etc. I find that my own children have a strong objection to putting anything in their mouths that has been touched or handled by someone else. The information with regard to the question of teeth, malformations of the teeth, decay of the teeth, with regard to the efficiency of the child, and subsequent adult, seems fairly adequate in showing to us that something must be done about the mouth. Having this information, there is then the question of education and the question of doing something about it. If we are going to do something about it in the schools, that is to say at the formative period of life, we have got not only to show that there is a certain degree of danger in carious teeth, a certain degree of interference with development, we must not be content with sitting down and admitting that this is so, we must do something about it. Just as in other matters of this sort, especially of school children, there are numerous objections raised, one of the most prominent of which is that if we do anything in the line of treatment in the schools, whether medical or dental or anything else, we are approaching rapidly a complete advanced condition of socialism in which everything, if you reduce the matter to a *reductio ad absurdum,* in which practically everything will be done for the children. It is an argument I have often heard, "Why stop with medical inspection? Why stop with dental inspection? Why stop with school children or children insufficiently fed at home? Why not supply them with clothes and everything else? In fact, why not remove them entirely from the care of the parents and bring them up under the care of the state?" Everyone must make his own decision as to how far the danger of that may be carried on, but it seems necessary to do something about it. The question has already been brought up of expense, with regard to the additional burden put upon the taxpayer; the objection has also been brought up in regard to the physician having possible cases removed from his jurisdiction and the possible reduction of his fees. This question has already been discussed in regard to dispensaries in other lines, and I think the decisions arrived at there may hold good here. As to whether follow-up methods should be pursued, that is a question that leads to a great deal of argument with us. On the question of expense, we need statistics as to whether it is more expensive to follow up the case at home, see that the father and mother take the child to a dentist, or whether it is less expensive to establish a clinic at school to care for the matter at once. I have no personal experience along these lines, but it would seem to me in a general way that unless something more or less strenuous is done with regard to these problems of carious teeth in school children, and not entirely in the school children of the poorer classes, we are going to have a persistence of the present very unsatisfactory conditions of the development of teeth and interference with education which we have seen in the higher grades of the school.

Dr. Fronzac, *of Buffalo:* I can thank the National Mouth Hygiene Association for doing the most excellent work they have been doing in being able to have dental inspection in our schools. Last year, when the International School Congress was held in Buffalo, the National Mouth Hygiene Association had a most wonderful exhibit and the result was that principals who had formerly tried to have dental inspection in schools and were unable to do so, have since been successful on account of the excellent exhibit of this association. In Buffalo we had medical inspection for several years; twenty-five school inspectors and school nurses, but no dental inspection till this year. We have now dental inspectors, dentists, assistant dentists, nurses, two dental dispensaries and one central dental dispensary. No child can obtain a child labor certificate if his teeth are bad and when he comes to the department of health for his child labor certificate, if his teeth are bad he must go to the dental dispensary and obtain a certificate that his teeth have been attended to, otherwise he cannot go to work until the age of 16. Recently I have been able to obtain through the Common Council of the City of Buffalo the passage of a resolution that in the future, no public school in the city of Buffalo, either elementary, high or technical school, can be accepted by the city unless there is a waiting room and a clinic whereby a dentist can work on the children's teeth in that particular school (applause), because we believe that no child can make progress unless it has good teeth. The child cannot digest, and if it does not digest it suffers from gastro-intestinal troubles, is pale, anæmic, sub-normal and will not be able to make any progress unless his or her teeth are good, and I therefore consider a dental clinic in a school building more important that a laboratory or many other rooms which formerly were considered unnecessary, and I hope that other cities will be able to have the success we have in being able to have dentists, dental dispensaries, and what is more important, a dental clinic in every school building in a community.

POPULAR EDUCATION IN MOUTH HYGIENE THROUGH ORGANIZED PUBLICITY—THROUGH THE PLATFORM, THE EXHIBIT, THE MOTION PICTURE, THE PRESS.

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Paper presented before Joint Session American Public Health Association and the National Mouth Hygiene Association, Jacksonville, Fla., Wednesday, December 2, 1914.

"PREVENTIVE medicine is the watchword of the hour, and enlistment in the cause can come only through education." Dr. Milton J. Rosenau, Professor of Preventive Medicine and Hygiene, in Harvard University, so voices a great truth.

Oral hygiene—the hygiene of the mouth—is one phase of the movement toward preventive medicine. Technically, it may be termed, preventive dentistry. It has developed a large body of truth, relating to the care and use of the mouth, with the result that progressive dentists and hygienists have come to realize their responsibility to the public in the matter of educating them to the importance of preventing dental decay by cleanliness, and more rational diet and mastication. The movement has steadily grown until it has been given the popular title of The Mouth Hygiene Propaganda. The slow process of education of the dentists, themselves, in the first place, and of the people at large, has been discouraging even to the optimists, and not a few of those who have been foremost as advocates before the public have fallen by the wayside, exhausted and disheartened over the slowness of response to this all-important truth. The united efforts of educational leaders and aggressive dentists made clear that the secret of success in getting the truth about the care and use of the mouth into the minds of the people with sufficient power, so that they would act upon the truth presented, lay in the force of publicity—organized publicity.

Mere publicity may be good; but organized publicity is best. Organized publicity means educational publicity. It represents a combination of the teaching art, and printers' ink. It unites the skill of the pedagogue and the genius of the publicist. A mastery of its underlying principles is essential to any forward movement in popular education, and an application of those principles in the field of mouth hygiene will yield the same return as is found in other great health-promoting movements. Organized publicity unites in one the functions of the teacher, the advertiser and the salesman. The aim of the advertiser is the aim of the salesman—to influence the human mind. Organized publicity goes a step farther, and seeks as an objective to influence the human mind to act, to apply personally the truth so conveyed.

I conceive the function of any well-ordered program of publicity to be, broadly, twofold: First. to awaken, inform and enthuse members of the dental and medical profession, and leaders in the great task of educating the youth of our country. with reference to the strategic importance of mouth hygiene in the personal and public health problem of the nation. Second, to enlist the rank and file of the people in the practice of simple rules of mouth hygiene in the light of its obvious advantages to the person, and to the community. The first function contemplates organized expert leadership for proficiency in propaganda. The second contemplates popular education for promotion of practice among all people of the simple rules of mouth health.

In contemplating the forces that are to accomplish this great task of awakening 90 per cent. of the people who are now more or less indifferent to the claims of mouth hygiene, nothing can surpass in value the enlightened personal professional service of the expert, of the dentist himself. As in politics, the leader must lead; so in the problems of diet and dentistry, the expert must advise. Before there can be publicity, there must be information. Science is organized knowledge, and science must master the laws of personal hygiene before attempting to give it as truth to the rank and file of the people.

The determining factor in a civilization, some one has said, is not in the opinion of the experts, so much as it is in the institutions of the people; and so, mouth hygiene is not a matter merely of the doctor, the dentist, the chemical expert, or of the schoolmaster alone: it is the concern of every man, and every woman. of every boy and every girl. The individual is the ultimate coöperative unit. He must know the plain truth about the proper use and care of the mouth. He must apply that simple knowledge for himself. Mouth hygiene, like the safety first, anti-tuberculosis, or anti-hookworm, must have the coöperative person, and the coöperative community as allies in the campaign for disease prevention.

The means of publicity, which are touched in this paper, are not all-inclusive. They are selected as the best methods of bringing about the results desired, economically and efficiently. The platform, the motion picture, the exhibit, the press are means of conveying truth to the minds of the people. The more perfect these instruments of publicity become, the more effectively will that truth be implanted in the minds of the people, and the more promptly will they be likely to act. It is expected that in due season, as a result of such a movement as that represented in the mouth hygiene propaganda, the average intelligent person will consider the proper care of the teeth, and the mouth, fully as important as the provision of the right kind of food and drink, and that that same person will come to understand that it is quite as important properly to cleanse and treat the mouth as it is properly to clothe the body when appearing upon the street. It is presumed that the ultimate goal of such a propaganda would be to establish as a habit, akin to the habit of the bath, the daily meal, the amenities of ordinary life—the habit of mouth cleanliness.

To bring this all about, a vast campaign of education must be promoted by those who realize the importance of the problem. Our dentists and our doctors must become teachers. Interest in the idea of caring for the teeth and mouth must be awakened. Well-informed interest in the habits about the care of the teeth and their preservation will result in better habits of mouth health.

The task is a task of changing the attitude of indifference, carelessness, and wilful neglect to one of positive conviction, as to the need for safeguarding the health of the mouth. The average intelligent person is not at all interested in health. He becomes concerned only in case of ill health. He gets interested in his teeth only after they have become diseased, decayed, troublesome. Toothache drives a man to the dentist. The great big job of the mouth hygiene movement is to get people interested and active in preventing diseased teeth, and teaching them the fundamentals about the care and use of the mouth. As the port-of-entry to that marvelous mechanism known as the alimentary canal, the vital importance of the oral cavity, so far as it relates to essential nutrition, and the nutritive processes, are concerned, must be taught.

The four principal agencies utilized in this campaign during the past four years, have been the platform, the motion picture, the exhibit and the press.

The people of America are not tired of informing lectures; they are wearied of mere vaudeville and entertainment on the lecture platform. A man with a real message about how to live and who knows how to tell it can always get a hearing. One has only to consult the lecture bureau managers to ascertain the fact that the lectures on various aspects of bodily health at the hands of qualified men are sought for constantly.

Witness Doctor Sperry, Doctor Barker, Doctor Wiley, Doctor Evans and Dr. W. S. Hall, Dr. Woods Hutchinson and others.

(Enlarge upon the platform as a feature. Mention the lecture bureau of the Mouth Hygiene Association, Dr. Edwin N. Kent, Director. Mention stereopticon slides. Develop an automatic device for showing the same.)

The *motion picture,* as a device for popular education, has been perfected and exploited so thoroughly that it needs only to be mentioned. One of the first things undertaken by the Mouth Hygiene Association was the presentation of a scenario entitled "Toothache." Nearly fifty of these films have been sold throughout the United States, and in Germany, Australia, Japan and South America; and it is estimated that the number of people who have been reached through health-weeks, under auspices of dental societies, and in schools, has mounted into the millions. The film is exhibited here in conjunction with the Southern Health Exhibition, and may be seen by the members of the convention who are not already familiar with it.

The New York State Dental Society has recently produced a new film entitled "Oral Health," which supplements the work presented in "Toothache," and shows why it is necessary to have a healthy mouth in order to have a healthy body, in a graphic and interesting fashion. There are a number of films, available for the use of mouth hygiene propagandists, which have to do with the nutritive processes, such as an x-ray picture of a stomach in actual process of digestion; tuberculosis films, and those relating to aspects of the food problem.

The *exhibit* has undergone a tremendous development in the past five years. Probably the International Tuberculosis Congress in Washington and the First International Congress on Hygiene and Demography gave the greatest impetus to the use of the exhibit as a means of popular education, and the attention of experts in the field of surveys and exhibits has pushed this device forward by leaps and bounds recently. The oral hygiene exhibit of the National Dental Association, and the Ohio Dental Society became the basis of the National Mouth Hygiene Association's Exhibit on oral health. This exhibit has been supplemented by a number of placards covering specific experiments in certain fields. It is felt that as it now stands, the exhibit is too technical to be widely useful in popular education, and plans are under way for revising this whole propaganda with a view to putting the simple facts more effectively before the people. There can be no doubt that the use of the exhibit as a means of popular education will grow, and that with it will develop a more effective use of this device.

The *press* is the great vehicle of socialized information. All education is a fitting for the service of humanity; but socialized education is a fitting of the greatest possible number for that service. The slogan of the survival of the fittest, has given away to the new ideal, that of fitting as many as possible to survive. The question of popular education in disease prevention is, How can we enlist the people in giving the mouth hygiene truth its proper place in their thought-life, and in their practice? It is a problem in applied economics; in applied science. In the solution of that problem, nothing can surpass an enlightened personal service, either professional, personal or general; but, to multiply the effective work of one man or one woman by the wide-spread influence of organized publicity through the million-tongued press, so that thousands will know and act in response to its daily stimuli today, where one did yesterday, is one goal of the mouth hygiene movement. Social and civic workers, leaders in education, advocates of personal and public hygiene, join the pioneers of the mouth hygiene in the dental and medical professions, to declare this new truth in disease prevention, to the people by word of mouth; but the program of organized publicity will add to the effectiveness of this message the science and art of diffusing information by a wise and effective use of the press.

Steadily the attitude of the daily press in America is changing on some of these fundamental matters of community interest. The city editor is becoming a community editor. Information in the field of health of vital moment to the people at large is being looked upon as a commodity quite as important in its value as the result of the baseball or football game, or quotations of stocks in Wall Street. As John H. Collins says, "One of the world's biggest staples today is information—a vital necessity. The successful man is the man who has the best information to act upon, and lack of information is found at the bottom of evils characteristic of our modern world. The newspaper is the principal medium for distributing information. People consume it as regularly as food, and it touches everybody oftener, and over a longer stretch of life than schools, churches, books, plays or any other information medium. For some reason, however, it has lagged behind in the general improvement of business. It still sticks to its original idea of telling what is wrong and abnormal in the world, whereas the world has reached the point where it also wants to hear what is normal and right. The newspaper will meet the modern needs better when it adopts some of the business methods that have proved better in selling pickles, and a little of the business policy used in making soap."

"Science cannot prevent disease. It can only tell people how to prevent it. To repeat the instructions over and over, to get them into everybody's consciousness, is an important duty." So writes the editor of the *Saturday Evening Post*, in commenting on disease-prevention day in the state of Indiana, by virtue of the governor's October proclamation. We have a long way to go yet in the economics of information. Fundamentally the thing is weak at the point of distribution. Organized publicity will help to strengthen it, and make the repetitions of instruction in matters of health as vital a factor as any other established feature of the daily newspaper. Papers like the *Chicago Tribune*, *Cleveland Plain Dealer*, *The Philadelphia Public Ledger*, *The Minneapolis Tribune*, and *The New York Times*, and now *The New York Tribune*, have shown the way, and with the steady rise of public opinion in these matters, there will be further response of greater intelligence, skill and enthusiasm manifested by our newspaper makers in all that relates to matters of vital health interest in the lives of the people.

We all agree that there is a best way to live, and that it is best to live the best way. The scientific leaders—the experts—must show us the way. The enlistment of the people, by means of popular education, through organized publicity, will follow as day follows the night.

Discussion.

Mr. Walter Storey *of the Russell Sage Foundation, Department of Surveys and Exhibits:* I have been asked to discuss the exhibit from the purely technical side. The exhibits of today are rapidly going forward from the technical side. The exhibits of a few years ago can no longer be considered. The exhibit work, that is of presenting an idea to the popular mind, is closely linked up with advertising, with the psychology of advertising. In the work which the various social organizations are doing today, they are making great strides toward putting forth an idea which ordinarily would be uninteresting to people, in an interesting way. There should be two classes of exhibits which are often confused. One is the purely technical exhibit, or rather the exhibit intended for scientific perusal, the other is the same subject but treated in a popular way. A great deal of very good material is lost on the popular mind because it is not steeped down so that it can be comprehended. Another phase of the work which has to be carefully considered is the method, the actual technical method of presenting it. The panel form or chart form is the most popular and apparently the best way of presenting ideas. In connection with that, the arrangement of the photographs, the cartoons and especially of the text has to be carefully considered. One has to remember that these small exhibits, while not very large in themselves, are generally associated in an exhibition where there are ten, twenty or fifty other collections of panels of the same kind, so that the visitor, by the time they get to your exhibition, is tired in mind and body to a certain extent, and you must give them something which will stimulate their minds and arouse their intellect to take in a fresh idea. The forms in which that is done are now being worked out very rapidly. We have the question of photographs which are not taken haphazard out of a collection which an organization owns, but taken especially for the need for which they are intended. If the exhibit is going primarily to school children or to young people, photographs of a certain subject have to be taken with that in mind. Photographs which are intended primarily for scientific viewing of a technical exhibit which those who know something about the subject will look at, of course can be of a more general sort. The use of cartoons is a great help in any exhibition. These can be made so that an idea can be presented in one picture which would take a whole sentence or paragraph to otherwise show it up. Then the attractiveness of the exhibit has to be very carefully considered. Sombreness in some exhibits is possibly in place, but after all we must remember that people go to exhibitions, in one way, to be amused. Many subjects are not interesting in themselves; we must make them interesting to the people, and to present an exhibition with very good material in it in a rather sombre and unattractive way, is defeating your own ends. The question of color, of arrangement, of spacing, of lettering, of the general decorative features—all have to be considered. In connection with the panels is the question of devices. Every exhibit, as I said, is composed mainly of the panels or placards. We must have the dimension exhibit to relieve the eye of the visitor. A booth simply filled with panels on its side is a very flat sort of object after a person has looked at twenty or thirty booths of that type, but they immediately become interested in any moving device or a model, and through a model an idea can be presented in a photographic way. They have to concentrate their attention, and anything that moves will do that. Today we have in the graphic exhibition a method of getting over ideas which in the past would have taken a great many books and in many cases we never could reach the people we now reach in that way, because a great many of the visitors to the exhibition are not those who read the papers or books, or special pamphlets gotten out on the subject which we desire to inform them upon.

Mr. E. A. Moree: I am not a doctor, I am simply an ordinary press agent. I don't see why they have a press agent talking about publicity, but somehow or other Mr. Jones thought we wanted it. I think that most public health workers and most public workers of any kind, in speaking of publicity as far as newspapers are concerned, usually think of the news articles, the so-called free publicity. That is a wonderful word—free. We see it in all the patent medicine articles and things that are sent you free until you get them and then have to pay the bill. It is just about the same with free publicity. There isn't anything free about publicity. You don't get your pamphlets free. You have a moving picture film made and you pay $1,000 for it. You don't get your halls free where you have your meetings and you don't get your publicity free. Now a lot of stuff is printed—and when I say stuff I am referring to it now as the newspaper man refers to anything that comes to his desk—(laughter) a lot of your stuff is printed and you don't pay anything for it in money, but you must, perforce, pay for it in news interests by furnishing the newspaper man something that he wants to print, something that he thinks his readers will want to read. Now, a good many long-suffering and good-natured newspaper men, of whom, up to five years ago, I was one, being one of these metamorphosed city editors who have become a community editor, in the words of Mr. Jones, a good many of those good-natured chaps will print articles that you send them simply because they like you and they think that you know a lot about the subject that you are writing about, and must perforce be conveying something of interest and importance to readers of the paper, so they print it. But tomorrow you will come around with something that hasn't the slightest semblance of news and ask that it be printed, and he will begin to look at you a little suspiciously, he will think you are riding a free horse to death, and most city editors do think that about public health workers and philanthropists generally—I will tell you that confidentially. There is only one way to avoid that—we are riding a free horse to death, riding him to death, not in furnishing a lot of stuff that ought not to be printed, not in furnishing him a lot of stuff for free use, but in furnishing him material that he has no business to print if he is a newspaper man. Just as often as we furnish to the newspaper editor a poorly written press bulletin, a poorly conceived press story, one that hasn't any news in it whatever, one for the printing of which we depend entirely upon the good nature and personal interest and the friendship of the news editor, just so often we are taking away our pull, if you may put it that way, with the newspapers. Now we have a good standing with the newspaper people; we are engaged in laudable work and for a good purpose, and the newspapers being interested, all of them with few exceptions, in good things, are naturally interested in getting our propaganda before the public, but we are running the risk of being cast out of the columns of the newspapers, the news columns of the newspapers, entirely, by not realizing that, with publicity the same as everything else, we must pay for it if we really get anything. Now I wanted to say two or three words about the value of paid advertising to all public health work and philanthropic work generally. If you get what you pay for and pay for what you get, in publicity, as in everything else, I think we must realize that in constantly applying to the newspapers for free publicity, we are getting always in our publicity simply the handout. If we are beggars and go around to the back door asking for a sandwich, we have to take what we get and cannot choose. Now there is a line in all publicity where the news ends and the advertising begins. Now we have not realized that, we have not got to the point of recognizing that the space in a newspaper is valuable space, that it is to be sold. We criticize justly the newspapers for printing the advertising of the quack doctor; we criticize them for printing the patent medicine advertisements, and the criticism is perfectly just, no decent newspaper man will take that back, no newspaper with a properly conceived policy will print patent medicine advertisements and quack advertising, but what would you do if you were a newspaper man and the tinsmiths of the town organized an association and passed a resolution that it was unethical, from a tinsmith's point of view, to advertise, and then those tinsmiths went around as individuals and roasted the city editor for printing the advertisement of a tinsmith who used putty instead of solder? How far do you think that tinsmith would get? That is what we have done as doctors. That is what the dentists have done from their point of view, and it is perfectly proper from their point of view; but the newspapers are in the business of selling advertising space and instead of devoting all your publicity fund to the purchase of pamphlets and the hiring of halls which you have to pay for, and to the purchase even of billboard space, isn't it perfectly fair, is it not only fair but the only honest course, to devote at least a portion of your advertising fund to the purchase of newspaper space? Then you won't have to take the handouts, you won't have to take the suit of clothes that is four sizes too large for you or seven sizes too small; you can write what you want and insist that it gets into the paper in the right place.

THE IMPORTANCE OF MOUTH HYGIENE TO GENERAL HEALTH

Harvey W. Wiley, M. D.,
President of the National Mouth Hygiene Association.

Address before Joint Session of American Public Health Association and National Mouth Hygiene Association, Jacksonville, Fla., December 2, 1914.

THE hygiene of the mouth is not a new study. It has been generally recognized for many years as an important adjunct to the hygiene of the body. It is only of recent years, however, that the study of mouth hygiene has assumed the dignity of a separate branch of public health activity. In the general oversight of the public health, the medical profession of the United States has taken the initiative and leading part. In the organization of mouth hygiene as a distinct branch of the public service, the dental profession of the United States has taken the initiative and is expected to assume the leading rôle.

Lack of care of the mouth and its appendages is prejudicial to health in several ways. In the first place, a decaying tooth is always a menace, and especially when the decaying process reaches below the gums. Ulcerations, pyorrhœa or Rigg's disease, and other infections of the root of the tooth, are difficult of access and treatment and for this reason are always to be regarded as a dangerous condition. Aside from the pain and suffering which these diseases of the teeth produce, we must not forget the possibility of direct infection. So-called blood poisoning and death have been frequent sequelæ of diseased teeth. Some forms of inflammatory rheumatism are thought to be caused by the infection of pyorrhœa, and in general the health is injured in proportion as the teeth are affected.

In the second place, defective teeth are a threat to health by reason of impairment of mastication and consequently of digestion. There is no difference of opinion concerning the value of good teeth, properly used, in the preparation of food for the digestive processes. While the vigorous stomach may attack particles of food of considerable size and resistance, the process of digestion is naturally slowed up in proportion to the magnitude and firmness of the unground particles. In addition to this, the admixture of healthy saliva to the food during the process of mastication is of no little consequence, especially in the digestion of starch. Thus defective teeth not only injure by reason of imperfect mastication, but likewise by reason of a failure to properly incorporate the saliva with the finely divided particles of the food while it is still in the mouth.

On Monday, the twenty-third of November, 1914, it was my good fortune to be invited to attend the first dental clinic ever held in the city of Washington in a public school building. Fifty of the progressive dentists of Washington have made an agreement to give two hours of their time per month to a public school clinic, and the Board of Education has set aside a small room in the Pierce school building, at the corner of G and Thirteenth Streets, Northeast, for the installation of the operating room. Gifts of dental chairs and apparatus have been made by dentists and others, so that the room is now equipped with two chairs and a small but somewhat effective set of apparatus suitable for clinical work on children.

For some time the city of Washington has instituted partial dental inspection of the children in the public schools. From the dental inspector I have obtained the following data: During the two years in which he has been engaged, for part of his time only, in dental inspection, he has examined 10,230 of the school children of the city, between the ages of six and sixteen years. He has found 32,307 cavities in the teeth of these children. He has found that of the permanent teeth 984 have been lost. He found a total of 81,910 teeth that needed systematic cleaning, and 6,056 that were so far decayed that they needed extracting. Of the total number of children examined, 9,071 had cavities in their teeth and 468 had abscesses at the roots of the teeth. A number of children whose mouths had been examined by the dental inspector were present for the clinic on the date mentioned. One need only look into those neglected mouths and note the ravages of disease and lack of attention and cleanliness to understand the urgent necessity of work of this kind.

It is a matter of shame that the capital city of the country is so far behind many of the other cities in a reform of this nature.* It seems almost incredible to believe that until the present time no systematic steps have been taken in Washington to remedy these crying defects. I imagine there are many other cities in the country even as badly off as Washington, and there may be some of the first class that have not yet installed a dental clinic for the benefit of those children whose parents are wholly unable to hire the work which is necessary.

In Washington it is proposed to operate in the public school clinic only on those children whose parents are unable to meet the expense of the work. Children of parents who are able to pay for the work will be given a card, describing the nature of the work which is necessary to be done, for presentation to their parents, and the school authorities will urge upon the parents the necessity of having this necessary work done. No attempt will be made at the present to bring any pressure to bear upon the parents by excluding their children from the school or otherwise. It is evident, however, that the full value of the dental clinic in a case of this kind will not be secured until some method is devised of bringing pressure to bear upon the parents in order that the dental work necessary may be done.

We now have a provision in our public schools which excludes unvaccinated children. This is a wise precaution to prevent the introduction of smallpox into the public schools. When it is remembered, however, that bad mouths, decaying teeth and neglected gums are doing far greater damage to the people of the city of Washington than smallpox, we may well ask why we are so careful in regard to the lesser danger and so negligent in the face of the greater? As I looked into the faces of these poorly nourished children, who, even if they had good food, would be unable to properly assimilate it, I was impressed with the magnitude of the work and the great underlying principle of humanity and philanthropy to which it owes its inception and to which it must look for support. It will evidently be some time before the school authorities of Washington are able to secure from congress the necessary authority and facilities to thoroughly renovate the mouths of the school children of the city.

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*In Boston, the Forsythe Dental Infirmary for Children, richly endowed, and housed in an ideal building, has been formally opened.

In Washington, as in many other places, the value of a good, wholesome luncheon for children has been fully established. By means of a popular subscription, warm luncheons, often with a piece of roast beef, have been provided for many of the indigent children of the city. Improvement in deportment and scholarship was most marked in these cases. Can we doubt that a similar improvement in deportment and scholarship would attend the renovation of the children's mouths? It seems to me that it would be very proper for this association in some official way to throw its influence toward a general movement throughout the country for betterment of conditions in the mouths of the children. Through the children, best of all, the parents can be reached, and through them the gospel of sanitation and hygiene of the mouth may be carried into the home and made the more effective.

Hundreds of the school children in Washington, and I suppose the same is true of other cities, have never been instructed in the use of the toothbrush and know nothing of its value. It seems almost incredible that such crass indifference, threatening the very foundations of society in so far as health is concerned, can prevail. I never realized fully the value of an organization of this kind until I attended this clinic and was overwhelmed with the testimony which was visually presented to me of the necessity of action. As I look at the matter it is highly important that we should begin our work of conservation of the teeth long before the children enter the school. The tooth is a tissue which needs a particular kind of nourishment. While it is true that there is no such thing as special food for nerves, or brains, or muscles, or teeth, it is true that a properly balanced diet is necessary for the general sustenance of the body. The tissues of the tooth are composed chiefly of lime, phosphoric acid and nitrogen. The foods that contain the proper amount of these bodies are therefore fundamental in securing the proper growth of the teeth. The campaign for sound teeth in the child should be inaugurated many years before his birth.

The temporary teeth of children should be good, solid and enduring, in order that they may remain in place until the permanent teeth are ready to erupt. Otherwise the permanent teeth may be extremely irregular in character and deformed in contour. If decay set in in the temporary teeth, it is highly important that it should be arrested by a filling of a cheap character but nevertheless sufficiently enduring to last as long as the temporary tooth. Thus the proper direction of the permanent teeth is secured, and at the same time they are not subject to any special germ of deterioration by reason of contact with decayed temporary teeth.

In regard to the production of teeth of the right character as a function of food, I may say that the milk of a healthy mother has in it all the elements necessary to nourish the temporary teeth. As some of these teeth, however, erupt after weaning, it is of the utmost importance that the child, after weaning, be fed a diet sufficiently rich in tooth-building material to produce a complete temporary set of teeth of the best quality and to lay the foundations for the production of the permanent teeth. My own experience leads me to believe that the child, after weaning, should receive a generous supply of pure, clean, wholesome milk from tuberculin-tested cows, and at the same time be fed cereals which have not been denatured. Of these, wheat, Indian corn, barley and oats are types. Rice which has not been polished and which has not lost the important principles of the rice bran may also be given once or twice a week in moderate quantity. As soon as the temporary teeth are sufficiently developed, hard substance, such as toast, zwieback or graham biscuits, should be given daily in sufficient quantity to develop, by the proper exercise of their functions, the character of the teeth. Fruits and vegetables suitable for the child's nourishment are not to be neglected. A little spinach once or twice a week is excellent in the furnishing of some of the elements, such as iron, which are important.

The things to be avoided in the nourishment of the young child are starch, sugar, candy and polished rice. The child that is fed good, wholesome milk and such cereals, fruits and vegetables as I have mentioned, needs scarcely any other adjuvant for the nourishment, not only of his teeth, but of all the tissues of the body. If milk is not given in some considerable quantity, a little powdered carbonate of lime or a little lime water may be given from time to time to supply the deficiency of lime in the cereals, where the phosphoric element is usually in excess. Such a diet will develop in the child a normal growth of temporary teeth and lay the proper foundations for those of a permanent character. If you do not get good teeth in childhood you will never have any. The mature molars are of but little account.

When the first permanent molars begin to erupt, the necessity for continuing this kind of diet is still paramount. In fact the whole regimen of the child, as long as growth continues, should be based upon a balanced ration in which all of the elements necessary to nutrition are present in proper quantities. This idea of the balanced ration in respect of the development of good teeth is somewhat at variance with the common practice of dosing children from earliest childhood, in fact, almost during infancy, with sweets. My own experience shows that a child has no natural sweet tooth. If he is not fed sugar and candy and other sweets he will have no craving for them, in fact, may have a positive dislike for them. Nature not only is one of the best chemists, but also one of the best hygienists. In the sugar which she puts in milk she finds no place for a sweet taste, milk sugar being almost devoid of sweetness. I am more and more convinced by experience, study and observation that the common habit of feeding children sugar, candies and starches is highly detrimental, and especially so to the development of the teeth. It is a common idea, which I think is a correct one, that the eating of sugar and candy is bad for the teeth. It is not so bad for the teeth, however, in the common acceptation of the term, which implies that the eating of sugar and candy tends to produce decay in the teeth. That, in my opinion, is not the chief objection. The eating of sugar and candy unbalances the ration and interferes with the proper composition of the tooth itself during growth, thus leaving it especially subject to the ravages of decay.

I urge upon this association the careful study of this problem, namely, the proper nutrition of the child to secure a good set of teeth. I believe we will come pretty close to striking at the heart of the trouble when, through investigation and study of this kind, we come to the conclusion that the child's food is the dominant factor in the character of his teeth. In thus emphasizing this important fundamental principle I do not in the least intend to minimize the importance of caring for the teeth once they are formed. The child who has hard, sound, regular teeth needs to be taught the principles of proper care. This means, of course, in the first place, the proper functioning of the teeth. There must be an abundance of chewing of the right kind and it must be well done. The tooth is no different from any other organ of the body. To be in prime condition it must be properly exercised. In order that it may be kept from the ravages of decay it must be kept clean. Eternal vigilance is the price of good teeth.

After the age of childhood, the care of the teeth, while not so important, is no less desirable. It is not at all uncommon at the present time to see men and women of middle age with false teeth or none at all. This of course means simply improper development of the teeth in the first place, or carelessness in their use in the second place. I do not know of any reason why the teeth should not last as long as the eye or the ear or any other organ of the body. While I am aware that age lessens the usefulness of all the organs of the body, I am an advocate of that course of life which would keep all of the organs in synchronic usefulness ending in synchronic decay. My ideal of life is set forth in that wonderful poem of Dr. Holmes (which most people think is only a bit of fun, and yet it is the expression of the most salutary philosophy), namely, the story of the One-Horse Shay.

Does anyone here doubt that human life would be very much lengthened and made far more endurable if, without the change of any other of the conditions of the environment, we could assure to men and women during their life an excellent, unimpaired and serviceable set of teeth? It would be extremely unscientific and unwise to make any estimate of how much human life would be lengthened if human teeth were kept in a perfect state, but I would not come far from the truth if I should suggest the average lengthening of life by many years as the reward of such an accomplishment.

I take it for granted that in this association no one will doubt that the greatest of human blessings is health. Health means not only freedom from pain and a capacity for enjoyment, but a great deal more than this. It means ability to serve. We hear much now of efficiency in business. We read of the stories of the efficiency engineer, who goes into a manufacturing establishment and turns a deficit into a profit without expending a single dollar more than was spent before. It is known as "system" or "efficiency." And so, without increasing in any degree the expense of human existence we may make it far more effective by the introduction of that system which secures the highest efficiency.

One of the dominant factors in this system is health. We all approve the efforts which are making everywhere to exclude the causes of disease, especially the causes of contagious and infectious diseases. To this end we establish quarantines, we destroy foci of infection, and we arm the individual with an additional resistance by means of antiseptics and disinfectants. We teach in our schools and colleges the principles of sanitation. It is a matter of gratification that the principles, as well as the practice, of the sanitation of the mouth are not to be neglected. In one great institution of learning in this country there has been established a department of mouth hygiene under the supervision of Dr. Wm. J. Gies, who has already done special service in studying the chemistry of the mouth. Other great institutions have departments of sanitation, hygiene and public health. I feel quite certain that the example which has been set by Columbia University will be speedily followed by other institutions of learning throughout the land.

Instructions of this kind will prove more effective than the teachings in the dental schools for professional students. It is a kind of instruction which will filter out through the newspapers and magazines and from the public schools and the pulpits of the country into the homes of all our people. Knowledge is a precedent to effective service in any direction, and effective service in sanitation cannot be accomplished by striking in the dark. We may sometimes by a lucky thrust in the dark strike our antagonist, but we are just as apt to strike a friend. It is the "pestilence that walketh in the darkness" which baffles human endeavor to suppress and not the pestilence which has come out into the open and "wasteth at noonday." Yellow fever and smallpox and typhoid and measles and whooping cough and diphtheria are all pestilences which have ceased to walk in the darkness and have come out into the light. These diseases are effectually combated. It is cancer and arterio-sclerosis and Bright's disease and diabetes that are still walking in the darkness. The pestilence that is destroying the teeth of our children or which has not allowed them to be produced has long been walking in the darkness. We will now bring it to the light, where effective work in guarding against it and in defeating its purposes may be accomplished.

At the Atlantic meeting of the American Medical Association last June, Doctor Billings read an instructive paper on focal infection as the cause of endocarditis, arthritis deformans, rheumatic fever, nephritis, acute and chronic, myocarditis, exopthalmic goiter, chalicystitis and diabetes, in which he said:

> The focus of infection may be located anywhere in the body. The usual site is in the head, in the form of alveolar abscess, deep tonsillar or peritonsillar abscess and chronic sinusitis.

Doctor Thayer, in discussing the paper, said:

> When one meets today a mitral stenosis or insufficiency he proceeds in a very different way from that in which he did twenty years ago. One's first thought now should be to search for a focus of chronic infection by the removal of which the probability of progression of the malady may be greatly reduced.

Doctor Anders said:

> If foci of inflammation are found there, they should, of course, be energetically attacked without delay. It is important to recollect that if removal of such focal infections fail to bring about a cure of the condition from which the patient may be suffering, it is not evidence to the contrary, but means, as pointed out by Doctor Billings, that hematogenous metastasis has already taken place.

Doctor Rochester said:

> I wish to speak of focal infections especially of the teeth and tonsils. In three cases having teeth infections accompanied by endocarditis in which there were no manifest symptoms in the mouth, but in which the Rœntgen ray showed an abscess at the roots of the teeth, when the abscess was removed the symptoms subsided and the patients improved clinically. The organism found was the ordinary streptococcus pyogenes.

While writing this paper, Doctor King of Washington told me of a case of diabetes which had just been under his care in which the removal of a pyorrheal tooth effected a speedy disappearance of sugar in the urine.

From the pathological laboratories of the University of Pennsylvania, Doctors Smith, Middleton and Barrett have just published a paper on "The Tonsils as a Habitat of Oral Endamebas," in which they say:

> In connection with work recently carried on by Smith and Barrett in the pathologic laboratories of the University of Pennsylvania indicating that the parasitic amebas of the mouth hold an important relation in the etiology of pyorrhea alveolaris or Riggs' disease, and that by the use of emetin (alkaloid) as an amebicide these organisms may be destroyed and the pyorrheal lesions cured, we have sought to determine whether these protozoa may not find their way also into the tonsils and there perhaps be of importance in determining or in maintaining certain of the inflammatory lesions of these structures, at least with or without associated systemic complications. To the present time only the first of these propositions can be said to be proved, that is, that these parasites actually at times involve the tonsils. The conditions of the tonsils of persons in whom they have been found infested, and the behavior of several positive cases with systemic complications after the administration of emetin, however, are decidedly suggestive and encouraging to continued investigation now in hand.
>
> Riggs' disease has for years been suspected of primary relationship to various systemic

disturbances, including particularly certain chronic or recurrent arthritic affections, and possibly, too, some of the anemias of obscure origin and degenerative lesions of various parenchymatous organs; and even greater suspicion, amounting almost to certainty, has attached to tonsillar affections in relation to such systemic complications. Following these ideas, which are essentially those of Hunter and others, the possibility of more generalized influences must necessarily occur, the effects of either the endamebiasis or of the associated bacteria, or both. Direct extension of the inflammatory processes, or lesions due to metastasis by lymphatic or hemic convection, or due to the effects of swallowed or absorbed toxic products are, logically, at least, to be thought of.

In several instances in the series of cases treated for pyorrhea by Doctor Barrett, there has been noted, after the cure of the pyorrhea, the disappearance of symptoms of gastric and intestinal disorders. Similar experience has been related to us by several dentists following emetin medication; and while perhaps in a few cases this may be due to the happy effect of a coincidence of pyorrhea and amebic dysentery (as in a case communicated by Dr. F. C. Narr of Philadelphia to us), this explanation can be accepted only in exceptional instances. It would rather suggest that the cure of the oral lesions has diminished the bacterial and other poisons which previously had been swallowed and had been causative of some grade of gastritis. . . .

Whatever other relation may obtain between the amebas and the accompanying vegetable microörganisms, one may be certain that the amebas feed largely on the latter and in this bacterial phagocytic action they doubtless set free from this and from that organism different endotoxins. Doubtless bacterial toxins thus originating play a more important part than do toxins from the amebas themselves, if there be amebic toxins; and the end-results of toxic absorption are sure therefore to vary, now manifesting as hemolysis, now as cellular degenerations or necroses of fixed tissues, now as inflammatory changes as of synovial or serous membranes.

Thus it is seen that many of the fundamental conditions which attend common infestations of the mouth reach out in organic connection with some of the most destructive and painful diseases to which we are obnoxious. Mouth hygiene thus establishes an organic relation to diagnosis and therapy in a manner which is most suggestive of proper prophylaxis and remedial treatment.

Pyorrhea alveolaris is the "great white plague" of the teeth and recent progress in its etiology and treatment is beginning to offer some hope of a speedy check to this tuberculoid pest. The intra-alveolar injection of a strong solution of bifluoride of ammonia and the intravenous use of emetin are indications of the therapeutic dental triumphs of the near future.

All who are here, and many thousands who are not, have enlisted in this army to battle for the public health. There should be no bickerings, nor cross purposes, nor envy, nor jealousy, to mar the effectiveness of our campaign. There should be no ingress of an attempt to serve mercenary interests under the guise of serving the public health. Allies can be effective only when they work to the same purpose. The National Mouth Hygiene Association has cordial organic relations with the American Public Health Association and with all similar organizations that are battling for the betterment of humanity. It is a good omen that we meet at the same place and in the same rooms and that our audiences are composed of the same people, that we are working in a common cause and our victory will be for the benefit of all humanity.

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MOUTH HYGIENE.

We devote a part of this issue of the Journal to the papers and discussion of the highly significant movement of Mouth Hygiene as presented before the joint session of the National Mouth Hygiene Association and the American Public Health Association at Jacksonville last December.

When Sir William Osler, addressing the students of the Royal Dental Hospital a few years ago, declared that they must preach the new gospel of mouth hygiene—"the cleanliness of the mouth; cleanliness of the teeth; cleanliness of the throat"—he voiced the conviction of leaders in the dental and medical profession who had been quietly pioneering what is known today as the Oral Hygiene Propaganda. And what Dr. Osler added in conclusion of his address is now recognized by the medical and dental experts everywhere as true: "Oral hygiene—the hygiene of the mouth—there is not one single thing in the whole range of hygiene more important than that!"

Here are some outstanding facts which indicate that the general appreciation of the significance of oral hygiene in relation to the personal and public health problem is growing tremendously.

The Goodrich Company of Akron, employing 15,000 to 18,000 people, inaugurated on the first of February last as a part of its Division of Safety and Hygiene, a finely equipped four-chair dental clinic. Its function as a part of the health-promotion program of this great industrial corporation is known by actual examination of every employee or prospective employee, the real condition of the mouth, including the teeth and tonsils. Its further function is one of education in the fundamentals of mouth hygiene and ministry to the cases requiring immediate dental service.

Of greatest significance are facts brought out in the first few examinations. Of 130 applicants passing through the dental clinician's hands in one day, only three could be approved as O. K. Another day, two out of ninety were passed.

Industry, in the interest of safeguarding community and personal health of employees, has here adopted what amounts to compulsory education of all in the care and use of the human mouth!

Five years ago Dr. Gulick found but five well-organized school dental clinics in the United States. Reports made October, 1914, to the Federal Commissioner of Education at Washington, from superintendents of schools, show 141 school dental clinics in 109 cities, maintained either by board of education, board of health or by volunteer agencies.

Rochester, N. Y., pioneered the organized school dental clinic, beginning in 1905. After ten years of voluntary maintenance of this service under the Rochester Dental Society's auspices, in March, 1915, the municipality voted $4,000 for support of the three established clinics.

Cleveland, Ohio, secured $30,000 by popular subscription in March, 1914, for maintenance of free dental clinics in the schools of the city, there being insufficient funds to do this work at public expense due to extraordinary conditions in Ohio school funds.

Kansas has just enacted a law permitting Kansas City, Kan., to establish a school dental clinic as part of the school activities. New York state had a bill introduced recently into the legislature providing for free school dental clinics.

In 1911, the National Mouth Hygiene Association was organized in Cleveland through the initiative of the Oral Hygiene Committee of the National Dental Association. Its chartered purposes were declared to be to teach the American people the significance of mouth hygiene in relation to general health and common welfare, and to unite in an effective working program those who believe that the economic value of clean, wholesome mouths justifies a special campaign of education.

THE VICTORY FOR PUBLIC HEALTH IN NEW YORK STATE

The New York State Health Law of 1913 is in many respects the most progressive and admirable yet enacted in the United States; and the group of experts (headed by Dr. Hermann Biggs), which has been gathered together to carry out its provisions, is probably unsurpassed by any state health organization in the Union. It was, therefore, with grave concern that American sanitarians learned of the attacks upon the law and the organization which were projected by influential politicians during the course of the legislative session which recently came to its close.

Two of the bills introduced by the majority leader of the overwhelmingly Republican Assembly robbed the Public Health Council (whose wise exercise of its power was editorially reviewed by us last October) of its power to fix expert qualifications for public health officials and required that the Sanitary Code, established by this body, must be submitted to the legislature for its approval. Another bill reduced the number of the state sanitary supervisors, who form perhaps the most important element in the whole scheme of organization, from twenty to ten. Another made the executive divisions of the department permissive instead of mandatory. Another required full-time service from the commissioner and the directors of divisions. With this latter requirement the Journal is of course in sympathy on general principles and provided it is applied to all state officials without discrimination. As aimed at the health department alone under the local conditions obtaining in New York it would simply have deprived the state of the inestimable services of Commissioner Biggs and in combination with the other measures cited above would have thrown the department open to political exploitation. Finally, nearly a dozen different bills were introduced to repeal the law which provides a minimum salary of ten cents per capita for local health officers in communities of less than 8,000 population.

Four of the worst of these measures passed the Assembly without a dissenting Republican vote. Then the people of the state began to be heard from. Letters and telegrams poured into Albany so that the desks of the legislators were buried in them. The newspapers rallied to the support of the department in a way that astonished its warmest supporters. Practically every paper in New York City took the most emphatic stand against the "ripper" bills and all through the state the same unanimity appeared, Republican papers being as vigorous as the Democratic ones, in their denunciation of any tampering with the health of the people.

It is said that the members of the Senate (which like the Assembly was Republican) grew so fearful lest the bills should pass, that whenever the chairman of the Public Health Committee, Senator Whitney, made a report, half a dozen senators were on their feet to make sure that he was not reporting them out without their knowing it. Senator Whitney, however, stood firm for the vital public interests in his charge and Governor Whitman took occasion to express his confidence in Commissioner Biggs and his determination to retain his services throughout his term of office. Not one of the bills aimed at the state department emerged from the Public Health Committee of the senate; and a bill abolishing the salary minimum for local health officers was decisively defeated on the last night of the session.

The lesson of all this is that Public Health is coming into its own; that it may and should be made a political issue in the good sense of the term; and that, if a health department in this present day achieves results and lets the people know about it, it need not fear the attacks of the politician.

THE SMALLPOX EPIDEMIC AT NIAGARA FALLS.

Linsly R. Williams,
Deputy Commissioner of Health, New York State.

Read before the General Sessions, American Public Health Association, Jacksonville, Fla., December 1, 1914.

General Description.

THE city of Niagara Falls is situated on the easterly shore of the Niagara River midway between Buffalo and Lake Ontario. The city of Niagara Falls was incorporated in the year 1893, having previously been an unincorporated village in the town of Niagara Falls. In 1892 the town of Niagara Falls, including the unincorporated village, had a population of 12,638; in 1900 the city of Niagara Falls, excluding the surrounding township, had a population of 19,457, and in 1910—30,445.

Before its incorporation as a city, Niagara Falls was famous for its falls, and consisted chiefly of a few hotels and boarding houses and a number of other residents whose livelihood depended largely upon the tourist trade. Before being incorporated as a city it began to grow as a manufacturing village, and after the installation of the electric power plant, developed by means of the water power taken from the falls, its manufacturing growth rapidly increased as well as its population.

Its population is mainly native-born white, being 59.5 per cent.—25 per cent. of native parentage; 34.1 per cent. are of foreign or mixed parentage, and 39.6 per cent. foreign-born white. Of the foreign-born, nearly 4,119 are Canadians, 1,272 English, 832 Germans, 839 Irish, 1,926 Italians, 1,395 Russians, 860 Austrians, the remaining number of foreign-born amounting to about 750. By far a large majority of the inhabitants are of the better class citizens—mechanics, etc., and although a fairly large percentage are foreign-born yet these foreign-born are, in the main, intelligent.

Niagara Falls, like many other cities in New York State, especially in the western part of the state, is quite enthusiastic about home rule, and has to a certain extent considered interference from the central state authorities at Albany as being unnecessary and onerous. In this connection it is interesting to note the typhoid rates for Niagara Falls:

Deaths per 100,000.

1900–5.	1906.	1907.	1908.	1909.	1910.	1911.	1912.	1913.
141.5	154.5	126.0	87.1	74.9	97.9	187.	71.5	29.4

An investigation of the sanitary conditions of the city of Niagara Falls was carried on by the Engineering Division of the State Department of Health during the summer of 1907, following which the Department urged a new or filtered water supply. Apparently continuing to believe in the principle of home rule no attention was paid to these recommendations, and in 1910 another investigation followed and not only the city authorities but the people of Niagara Falls were warned of the danger of continuing to use the unfiltered river water for drinking purposes. It was not, however, until December, 1911, that filters were installed with the addition of hypochlorite treatment. The table shows a marked reduction in the death-rate per hundred thousand population since the installation of these filters.

History of the Epidemic.

The first compulsory vaccination and re-vaccination law went into effect in Japan in 1885. Notwithstanding the enactment of this law they record in Japan during the following three years 125,000 cases of smallpox, with a mortality of 25 per cent. In 1860 the legislature of the state of New York enacted a law which reads that "no child or person not vaccinated shall be admitted or received into any of the public schools of the state, and the trustees or other officers having in charge the management or control of the schools shall cause this law to be enforced." Notwithstanding this law there have occurred in New York State during the past seven* years an average of 613 cases of smallpox a year, the large majority of these cases occurring in adults. Both of these facts have led the opponents of vaccination to conclude that vaccination did not protect against smallpox.

A review of the facts connected with the Niagara Falls epidemic explains to a certain degree the reason for smallpox continuing to be present in New York State.

On April 18, 1912, the health officer of Niagara Falls asked for assistance in the differential diagnosis of smallpox from chickenpox. The following day a diagnostician from the State Department of Health diagnosed five cases of smallpox in one family, none of whom had ever been vaccinated. The original case in this family was discovered in March in a little child ill with what was believed to be chickenpox. The health officer could not trace the source of the first case. The family lived near the railroad yards, and the child was said to have played with Italians who passed by to and from their work. Two cases across the way developed from this original focus. Chickenpox was not a reportable disease, and chickenpox had been prevalent at the Falls.

On May 9 a diagnostician was again sent to Niagara Falls and found two girls aged 9 and 11 who attended the same school that the children in the previously mentioned family did. Neither of these children had ever been vaccinated.

It was well known to the State Department of Health that Niagara Falls was an anti-vaccination center and that serious danger existed of a large number of cases occurring there. It was also known that this sentiment would cause serious difficulty in controlling an epidemic.

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*See Table No. 18.

The following instructions were given to the health officer May 9:

To vaccinate all persons directly exposed, or else quarantine them for at least two weeks.

To notify the managers of shops and factories where persons had been exposed to require such persons to be vaccinated before they returned to work.

Although the health officer was well-intentioned, it took exactly 20 months to carry out these two suggestions. These instructions were given to the health officer, and no further requests for assistance were made until the following year, although cases were reported to the State Department of Health each month during the remainder of the year. No general vaccinations were performed, and no serious effort made to control the disease, and only a few of the cases were sent to the quarantine hospital.

The next news about smallpox at Niagara Falls was received from the State Commissioner of Health of Pennsylvania, who wrote on January 14, 1913, that two men with smallpox had come to Centre County, Pennsylvania, from Niagara Falls. On January 23 another case was reported from Lewisburg, Pa., that had been traveling in Western New York.

On January 25, 1913, the health officer of Niagara Falls was notified of these facts, but no action was taken owing to a new health officer being appointed about February 1, 1913.

On February 21, 1913, the new health officer reported to the State Department that there were ten cases of smallpox in the city, and asked for assistance. A diagnostician was again sent and he found two positive cases in the quarantine hospital.

Early in the year an article appeared in a Memphis paper urging vaccination, and written by W. A. Evans of the Chicago *Tribune,* who referred to Niagara Falls as a "Plague spot" and stated that there were eight new cases of smallpox reported the week ending February 26. This statement was apparently challenged by the Christian Science Committee on Publications of the state of Tennessee, who telegraphed the mayor of Niagara Falls asking if the statements were true, and received no answer. This Committee then telegraphed the president of the Board of Education of Niagara Falls and received the following reply: "Statement that smallpox is epidemic in Niagara Falls absolutely without foundation. Not a single case of the disease in the city." This statement was written when the health officer knew of ten cases of smallpox in the city.

The State Department of Health again made recommendations to the health officer, but no definite action was taken, and not until on November 26, 1913, was another request received for assistance, and again cases of both smallpox and chickenpox were found.

On December 14, 1913, another request was made for assistance, apparently as a result of a threat of quarantine made by Buffalo. For the first time since the cases developed at Niagara Falls the physicians were assembled and urged to coöperate and vaccinate exposed persons. The physicians met with the Board of Health, but no definite instructions were formulated by either state or local department at that time.

On the 19th of December and again on the 28th and 29th the State Department of Health sent a representative who found the situation much the same—new cases constantly occurring and but little activity among the city fathers except talk. The health officer, an informed and competent physician, was utterly unable to do more than have several schools closed, and the year 1913 closed with little having been accomplished.

On January 3, 1914, a letter was sent to the leading citizens urging the importance of vaccination, and the leading manufacturers were persuaded to urge their employees to be vaccinated. In one instance where a case of smallpox was found in a factory the manager offered free vaccination or two weeks lay-off without pay, and only seven out of 97 employees accepted vaccination.

On January 6 there were 51 active cases, most of whom were in their own homes. On this day the mayor, the health officer, the Health Board, and Industrial Commission held a conference with the representative of the State Health Department, and the department's representative urged that nurses be employed to inspect the schools and factories and that every suspicious case be quarantined, and that this quarantine be rigidly maintained, and that special physicians be designated for vaccination.

By the 9th of January some actual progressive work was being performed; house quarantine enforced by special officers; doctors investigating and giving free vaccinations (over 700 vaccinated this day); 17 nurses making daily visits to schools, factories and homes; a daily citizens' meeting with the Health Board to discuss the situation, and an earnest desire on the part of the manufacturers to have the epidemic controlled.

Notwithstanding all these efforts "the man on the street" said that there was no smallpox in Niagara Falls; that vaccination was killing lots of people; anti-vaccination literature was freely distributed, and the local papers were openly or tacitly sympathetic to the anti-vaccinationists.

On January 12 there were 75 known cases, with but few of these in the quarantine hospital, which with accommodations for 30 patients had never been filled. Vaccination was proceeding—about 500 a day.

Smallpox began to be reported from varying cities, towns and villages nearby.

By January 19 the quarantine hospital was filled, and 66 houses were under quarantine. In most of the houses where cases had occurred, secondary cases followed, vaccination having been refused, and 110 special police were employed.

On January 20 there was a change of administration at Albany, which had for some days been pending, and Dr. Hermann M. Biggs was appointed Commissioner of Health, and the day following a special representative of the State Department was authorized to go to Niagara Falls and take entire charge of the situation. On January 27 more urgent measures were adopted. The local Department of Education refused to do anything in regard to the compulsory vaccination law.

The attention of the local authorities was called to the fact that the health officer had, by city ordinance, power to remove any case of smallpox from his home to the quarantine hospital. The city attorney, however, openly advised against this procedure as being illegal and unconstitutional until the attorney general of the state handed down an opinion that this city ordinance was legal and constitutional.

On January 28, 1914, a bulletin was issued to the health officers of New York State, calling their attention to the amount of smallpox in New York State.

On the same day the following telegram was sent to Dr. Edward Clark, the State Department's representative at Niagara Falls:

"More radical measures must be taken in Niagara Falls to suppress the epidemic of smallpox. The people of other portions of the state must be protected against the follies of any local community at whatever cost may be necessary.

"I should much prefer that the Department should act in coöperation with the local authorities rather than issue direct orders for enforcement.

"In my judgment the following measures should be immediately adopted by the local authorities:

"1. Close all places of public assemblage; churches, theaters, dance halls, moving picture shows, similar places of entertainment, public libraries, etcetera.

"2. Close the public schools, or exclude from attendance all unvaccinated school children.

"3. Close the factories and workshops of all kinds, or exclude all unvaccinated employees.

"4. Close the hotels, or require the vaccination of employees.

"5. Enforce rigid quarantine against all houses containing smallpox cases and all exposed and unvaccinated persons.

"6. Remove to isolation hospital all cases of smallpox so far as accommodations permit.

"7. Enforce strictly all the provisions of the Sanitary Code of the City of Niagara Falls.

"Kindly request the mayor to call a meeting of the local authorities, prominent business men, and manufacturers and present this telegram to them.

"It would be most unfortunate, in my judgment, from all points of view, if it should become necessary to absolutely isolate Niagara Falls from its relations with other portions of the country.

"Kindly advise me what decision is reached and what action is taken. Do you desire further assistance?

H. M. Biggs."

On January 29 the mayor, health officer, and business men held a meeting and unanimously adopted a series of resolutions embodying all the recommendations of the State Department. These resolutions were also adopted by the Niagara Falls Board of Health.

A large number of persons in Niagara Falls still believed that smallpox was not present; that it was all a bluff, and vaccination was being enforced because the doctors needed business. And others believed the commissioner's suggestion of January 28 that it might become necessary to isolate Niagara Falls from the rest of the world, was also a bluff.

The State Department of Health had received assurances from the railroads passing through Niagara Falls that notices would be placed in all stations in New York, and warnings in all passenger cars whenever desired, and that if necessary no passengers would be allowed to depart from or alight at Niagara Falls.

Notices were printed and in readiness for distribution January 31, 1914, as follows:

WARNING! SMALLPOX!

Hermann M. Biggs, M. D.,
Commissioner.

NEW YORK
STATE DEPARTMENT OF HEALTH
ALBANY

Mr. A. H. Smith, *President, New York Central Railroad, Grand Central Terminal, New York City.*

Dear Sir: There exists at the present time an epidemic of

SMALLPOX AT NIAGARA FALLS

due to the local prejudice against vaccination. There is serious danger of the transmission of the disease along the lines of the railroad to all parts of this state and to other states. There is also danger of infection of the railroad employees. Before taking any more drastic action in relation to the existing situation, we wish to ask the assistance and coöperation of the officers of the transportation lines running into Niagara Falls in respect to the following measures:

1. That the officers of your company use every means to induce your employees, especially on the divisions west of Syracuse, to protect themselves from infection by immediate vaccination.
2. That in case of illness of any employee living in Niagara Falls, notification be immediately sent to the health officer of the city.
3. That your employees be warned to mingle as little as possible with the citizens of Niagara Falls.
4. That all persons who have no business to transact and who are not entering or leaving trains at Niagara Falls be excluded from the station.
5. That a notice be hung at the end of every passenger car on every train stopping at Niagara Falls, warning passengers of the existence of smallpox and cautioning them against stopping in Niagara Falls, unless they have been protected by a recent and successful vaccination.

There are at the present time about 133 cases of smallpox at Niagara Falls. We hope by the adoption of active measures to prevent further extension of the disease, and we ask for your assistance and coöperation to this end. Notices for posting in railroad stations are being forwarded.

Very sincerely yours,
HERMANN M. BIGGS, *Commissioner of Health, New York State.*

WARNING

SMALLPOX

EXISTS IN EPIDEMIC FORM IN NIAGARA FALLS.

Passengers are warned not to stop there unless they have been protected by recent and successful vaccination.

BY ORDER OF THE NEW YORK STATE DEPARTMENT OF HEALTH.

Fully realizing the incalculable monetary damage that such a procedure would cause their city, redoubled efforts were made by the business men to secure the vaccination of their employees and all other persons.

The commissioner, having received assurances from the mayor, board of health, and business men, that his recommendations would be carried out to the letter, the order was rescinded.

The activity of the Niagara Falls authorities was made the more zealous because the Dominion had quarantined Niagara Falls and had guards at the Canadian end of the bridge over Niagara River, and allowed no one to enter on foot, vehicle or trolley without a vaccination certificate.

On February 5, 1914, the following official bulletin was issued to all the health officers of the state, giving detailed directions for the control of smallpox, as follows:

"Smallpox now exists in epidemic form in Niagara Falls, and new cases in nearby places are almost daily coming to the attention of the department. Twelve cases in nearby outlying towns which had not been reported were discovered by a representative of the department last Thursday, and on Friday in two other towns, eight were found which had been diagnosed as chickenpox. Some of these were of a severe type and recovery is uncertain.

"This condition of affairs must not continue. Every case of smallpox or chickenpox, as well as every other case of any reportable disease, *must be promptly reported* to the local health officer, as required by law.

"You are hereby directed to at once take active measures to secure the prompt report of every case of infectious disease occurring in the territory under your jurisdiction, and to report the same to the State Department of Health as required by law. It is the duty of every physician, nurse, teacher, clergyman, householder, employer, police officer, hotel or lodging house keeper, head of a family or other person who has knowledge of any such case to report it to the health officer.

"Upon being informed of the existence of a case of any contagious disease you are further directed to at once adopt such measures as are necessary to prevent its spread.

"In dealing with *smallpox* you are directed to take the following action:

"1. Every case diagnosed as smallpox shall be immediately isolated and kept isolated until the patient has fully recovered and all danger of the transmission of the disease has passed. If an isolation hospital is available within your jurisdiction every such case must be immediately removed there. Health officers have full power to cause such removal by force.

"2. Every suspected case of smallpox should be isolated until a definite diagnosis has been made, and all exposed persons should be at once vaccinated.

"3. Every person known to have been exposed to smallpox (contacts) should be immediately vaccinated. If the vaccination is within 48 hours of the time of the *first* exposure the person may be required to report for observation daily to the health officer, or to someone designated by him, until the vaccination takes or until a period of sixteen days from the *last* exposure has elapsed. If the first vaccination is not successful, all such persons should be revaccinated. These persons need not be quarantined if they are seen daily, and immediately isolated on the appearance of any symptoms.

4. "All persons exposed to smallpox who have *not* been recently successfully vaccinated and whose first exposure antedates forty-eight hours and who are immediately vaccinated, should be isolated and quarantined until the vaccination has definitely taken (for at least one week), or if the vaccination fails, until the full period of incubation of smallpox (sixteen days from the last exposure) has elapsed.

"5. All persons exposed to smallpox, who have been vaccinated recently with a successful result, may be immediately discharged from observation.

"6. All persons known to have been exposed to smallpox and who refuse vaccination, should be strictly quarantined for sixteen days from the date of the last exposure.

"7. A record should be kept of the names and addresses of all exposed persons, the action taken with reference to each, the date of vaccination, the dates of observation, with notes of the results of vaccination, (whether successful or not), and when revaccination is done, the date of this.

"8. When a person suffering from smallpox is quarantined in a house or an apartment a record should be made of the name and age of every person living in the house and these quarantined, and their presence in the house should be verified daily.

"9. If any person under quarantine escapes from observation, every effort should be made to determine where such person has gone and immediate notifications made to the Department of Health at Albany.

"10. During the prevalence of smallpox in the state the diagnosis of every case of chickenpox reported to you should be confirmed by a representative of the local health department, and such cases should be immediately reported to the Department of Health at Albany. In any case where the diagnosis is doubtful the patient should be isolated immediately, all exposed persons should be vaccinated, and the State Department of Health notified.

"11. You are requested to make a weekly report to the Department of Health of the number of vaccinations performed by you and also the number performed by others in your district so far as known to you.

"12. If the law excluding unvaccinated persons, whether school children or teachers, from the schools under your jurisdiction has not been enforced, you are requested to notify the State Department of Health and to direct the attention of the school authorities of the district to this fact.

"A campaign of education concerning the benefits of successful vaccination should be inaugurated in your district and carried on with vigor. This can only be accomplished by a strict compliance with these directions and by the practice of general vaccination, especially of all persons living in those sections of the state where smallpox is prevailing.

H. M. Biggs."

On February 7 one factory in Niagara Falls still refused to obey the recommendation that it be closed or its employees be vaccinated, and again it was necessary to threaten isolation of the city.

On February 9 the following notice was posted at the above mentioned factory:

> "IMPORTANT!
>
> "Tomorrow—Wednesday morning, be sure and bring certificates of vaccination or evidence of vaccination which it will be necessary for you to have before you can start work.
>
> "Automatic Dept., Storehouse, Engine Room employees will present certificates at Automatic door, all other employees at general entrance on Highland Avenue.
>
> "There can be no exceptions made."

By February 12 it was estimated that 18,923 vaccinations had been performed, and it was expected that there would soon be a diminution of the number of cases.

January 30	76 houses quarantined.
February 6	61 houses quarantined.
February 13	35 houses quarantined.

For the first time an appreciable improvement.

On February 17 a delegation consisting of the mayor of Niagara Falls and seven business men came to Albany asking for the removal of restrictions and that less publicity be given to smallpox in Niagara Falls, to which request the commissioner made the following answer:

> "The policy the department will pursue is one of complete publicity. That is the only way in which we can hope to obtain and retain the confidence of the public. If we say that there is no danger in any given situation we want the public to believe us. If we say that wholesale vaccination is necessary we want to have our advice followed. Any other policy than that of absolute honesty and full and frank publicity in public health work is ruinous. If you have smallpox, admit it and let other people know it. Through concealment you delude yourselves and lay others open to danger from which they cannot protect themselves. That is why we have given to the press such communications as we have found necessary to send to Niagara Falls."

On February 25 there were 15 houses quarantined, containing 39 cases; 15 in hospital.

February 26, 13 houses quarantined. Total 48 cases.
February 27, 12 houses quarantined. Total 46 cases.
February 28, 12 houses quarantined. Total 43 cases.
March 3, 9 houses quarantined. Total 33 cases.
March 4, 7 houses quarantined. Total 25 cases.
March 5, 7 houses quarantined. Total 23 cases.
March 6 (total vaccinations to date—25,184.)
March 8, 6 houses quarantined. Total 17 cases.
March 9, 4 houses quarantined. Total 11 cases.
March 10 (churches and places of public assemblage allowed to open.)
March 10, 3 houses quarantined. Total 13 cases.
March 11, 3 houses quarantined. (1 new case reported.) Total 13 cases.
March 12, 2 houses quarantined. (Public vaccination station closed.) Total 12 cases.
March 13, 2 houses quarantined. Total 12 cases.
March 15, 1 house quarantined. Total 10 cases.

March 16, 1 house quarantined. Total 10 cases.
March 17, 1 house quarantined. Total 7 cases.
March 18, 0 houses quarantined. Total 6 cases.
March 26, 0 houses quarantined. Total 1 case.
March 27, no new case since the 11th.

The Niagara *Press* on this date stated that there had been a few cases of Cuban itch and chickenpox at Niagara Falls, but no smallpox.

On March 30 the last case was released from the quarantine hospital.

One case was reported early in April, and on April 28th one case was reported, the last to date.

TYPE OF CASES.

The general type of cases was mild and discrete. There were few patients who were really seriously ill and there was only one death. No definite attempt was made to determine the actual period of incubation, but in those cases which were definitely noted it was found that from 12 to 15 days was the usual period after known exposure.

CLINICAL SYMPTOMS.

The clinical symptoms were very similar to those commonly described· The prodromal symptoms of headache were usually frequent and almost always severe backache, and a feeling of malaise, lasting from 2 to 3 days, and occasionally nausea and vomiting and a slight temperature. With the onset of the eruption there was an abatement of the severe backache and a diminution of the fever, and many patients felt well enough to go out and were up and about and frequently were found at work during the eruptive stage.

The large majority of cases was discrete, although there were a number of confluent and semi-confluent cases. No cases of hemorrhagic type were observed. The one patient that died had a septic condition.

STATISTICAL.

Reported cases of smallpox in New York State by months from January 1908 to November 27, 1914:

Year.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1908	265	71	108	49	48	59	8	4	5	92	55	20	784
1909	63	72	32	33	42	25	16	12	2	7	29	53	386
1910	51	50	69	61	55	41	10	10	1	1	2	2	353
1911	7	5	6	5	34	33	25	14	9	9	24	170	341
1912	178	88	54	33	41	24	35	22	44	48	192	135	894
1913	67	64	94	129	87	77	72	27	24	21	73	88	823
1914	322	251	59	37	38	11	3	1	3	2	7		734
													4,315

Reported cases of smallpox in Niagara Falls from 1908 to 1914, according to date of report:

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1908	1	0	1	6	0	2	0	0	0	0	0	0
1909	0	1	0	1	0	0	0	0	0	0	0	1
1910	4	0	0	0	4	1	0	0	0	0	0	1
1911	1	0	0	1	0	0	0	0	0	0	0	0
1912	0	0	0	9	10	5	13	16	3	1	2	9
1913	9	18	3	3	9	7	4	6	5	9	66	57
1914	204	121	10	2	1	0	0	0	0	0	1	

In the year 1908 there were 10 cases of smallpox in Niagara Falls; 3 in 1909; 10 in 1910, and 2 in 1911, an average of 6.25 per year, or approximately 20 per hundred thousand per year, the population of Niagara Falls at that time being 30,000. This would have meant in New York City 1,000 cases per year, or 2,000 cases per year throughout the state, during which time the number of cases of smallpox throughout the state averaged less than 400.

In 1912 there were 66 cases of smallpox reported from Niagara Falls, or 204 per hundred thousand, which in New York City would mean 10,400 cases, or throughout the state 19,500 cases during that year, whereas the total number of cases in 1912 in the state of New York was 894.

In 1913 there were 176 cases of smallpox reported from Niagara Falls, or 51.7 per hundred thousand, which would mean 26,800 cases for New York City, or 50,200 for the whole state, whereas there actually were for the entire state 823 cases of smallpox reported.

During the year 1914 there were reported from Niagara Falls 339 cases of smallpox, the last case being reported April 30, 1914, that is, 965 per hundred thousand, or 51,800 cases for New York City, or 95,500 cases for New York State, whereas there actually were reported in New York State 734 cases.

From the first of January 1912 until the 30th of April 1914 there were reported from Niagara Falls 550 cases of smallpox. Of this number 286 were between the ages of 15 and 45, or 52 per cent. Under 5 years there were 33 cases, or 6 per cent. The complete tabulation of the age groups is as follows:

	1912	1913	1914
Under 1 year	1	2	2
1 to 5 years	3	9	16
5 to 15 years	21	91	64
15 to 45 years	31	110	145
45 and over	11	13	17
Unknown	1	3	10
Total	68	228	254

OCCUPATIONS.

Of these 550 cases 33 were in children under 5 years; 190 were in school children; 52 in housewives; 22 in laborers; 71 in mechanics or operators in factories; 6 among city employees; 3 in mail carriers but employed in the post-office; 8 in railway employees; 2 in teachers; 26 miscellaneous occupations; 8 employees in business occupations, and 112 whose occupations were not given.

NATIONALITY.

It was a matter of extreme interest to note that in almost every instance the individual affected was a native-born American, and usually of the more intelligent class. Unfortunately the cards for reporting communicable diseases did not ask the question of nationality, so it is impossible to give definitely the number of cases among foreigners, but it was quite evident to all who had anything to do with the epidemic that it was chiefly among the better class American citizens.

VACCINATION.

Reference has already been made to the school law enacted in 1860, yet this law has practically been a dead letter and has never been enforced with any degree of vigor. A serious attempt was made to enforce it in the city of Olean in 1912, but the citizens of Olean made such a strong protest against it that the then Commissioner of Education did not enforce it.

The records of the cases of smallpox reported to the State Department of Health from 1908 to date show the following:

That of the 784 cases reported in 1908, 508 or 64.7 per cent. were never vaccinated. In 1909 of the 386 cases reported, 333 or 86.2 per cent. were never vaccinated. In 1910 of the 353 cases reported, 246 or 69.6 per cent. were never vaccinated.

*Total number of cases reported 1908–1914	4,315
Number never vaccinated	2,886
Per cent	73
Vaccinated 5 or more years previously	368
Per cent	9
No data	408
Per cent	10
Per cent. vaccinated within 5 years	8

* Omitting 341 reported in 1911.

Of the 550 cases of smallpox reported from Niagara Falls during the years 1912, 1913 and 1914, 483 cases or 87 per cent. had never been vaccinated; 26 or 4.6 per cent. had been vaccinated more than five years ago. Out of the 550 cases only 5 gave a history of having been vaccinated within five years, or .9 of one per cent.

Strong anti-vaccination sentiment exists in certain parts of New York

State, especially in the western part of the state in the counties of Niagara, Chautauqua and Cattaraugus, the cities of Niagara Falls and Olean having carried on for years a strong anti-vaccination campaign.

Marked assistance to the campaign has been rendered by the Anti-vaccination League of America, of which Mr. Chas. M. Higgins of Brooklyn is treasurer. Dr. John W. Hodge of Niagara Falls, a well-known physician in that locality, with a large practice, is also an ardent anti-vaccinationist, and during the last twenty years, as far as one can learn, practically no vaccination has been performed in Niagara Falls. This has been well known to the officials of the New York State Department of Health, and an epidemic of smallpox such as occurred in Niagara Falls had long been heralded.

The attitude of the citizens, and especially of the city officials, made the suppression of the epidemic an extremely difficult task, the president of the Board of Education and the city attorney being strong anti-vaccinationists, and the anti-vaccination sentiment being particularly strong among the better class of American citizens. Practically no headway was made against the epidemic until the business interests of the city realized that the epidemic was assuming serious proportions and cases were developing not only in the surrounding towns and communities, but that local epidemics were developing in adjacent counties, and that the Commissioner of Health would be compelled to quarantine Niagara Falls from the rest of the state, and as quarantine had already been established by the Province of Ontario against Niagara Falls that there would be serious economic loss if active measures were not taken to suppress the epidemic. Pressure was then brought to bear upon the city authorities, and the recommendations made by the State Commissioner of Health were energetically carried out.

Two weeks after this there was a marked diminution in the number of new cases developing, due chiefly to two facts—one, an opinion by the attorney general that the Sanitary Code of Niagara Falls providing that all cases of smallpox should be promptly removed to the quarantine hospital was entirely constitutional and legal; and second, that general vaccination was being performed.

One large manufacturing concern informed the representative of the State Department in January that 50 per cent. of its employees had been vaccinated and that it was not possible to have any more vaccinated. Three weeks later this same concern showed satisfactory evidence that all but three of their employees had been vaccinated, 300 or 400 having been vaccinated. Of these 3 one was at home sick; one had had smallpox, and the third was on the road as a traveling salesman.

EXTENSION OF SMALLPOX FROM NIAGARA FALLS.

During the years 1912 and 1913 there was apparently no definite extension from Niagara Falls, although a few cases of smallpox did occur in scattered localities having definitely become infected in Niagara Falls. With the beginning of the year 1914 new centers of infection were reported throughout the western part of the state. A few cases occurred in points in Pennsylvania and in New York City. Several new foci developed, which were readily traced to Niagara Falls, and others traced only with difficulty. In one instance a barber escaped from quarantine in Niagara Falls and continued to pursue his trade in a neighboring village, and nearly all of his customers in succession developed smallpox.

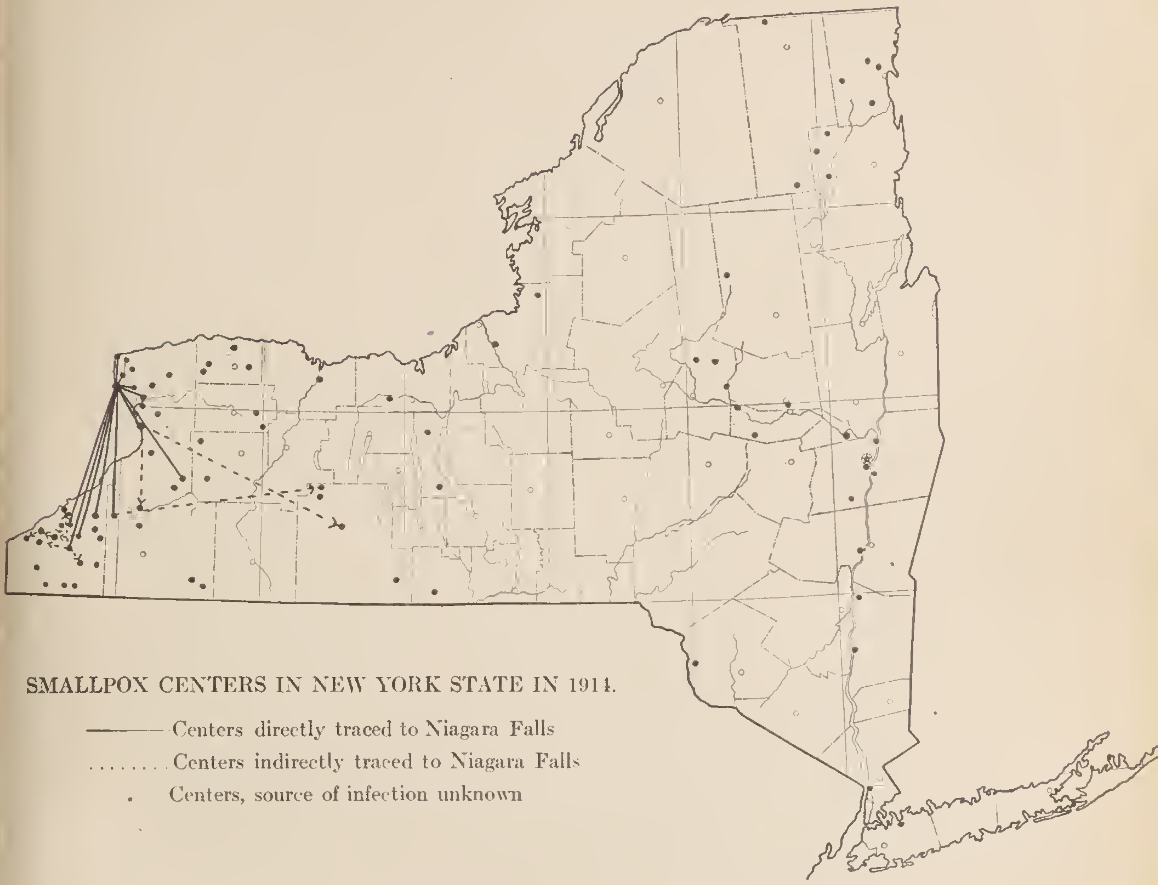
Another instance was the meeting of a religious sect known as the Holy Rollers, who met in a county and at this gathering were several residents of Niagara Falls. Two weeks after this meeting a large number of the persons who were at this meeting developed smallpox.

At a third gathering in Chautauqua County there were a large number of persons who were exposed at the same time. These persons came from many different parts of the state and were all exposed to one of their members who had active smallpox at the time of the meeting. This became known to a newly appointed representative of the State Department of Health, who was able to secure immediately after the meeting the names and addresses of all the persons at the meeting, and who then notified the health officer of the locality in which each individual lived, advising immediate vaccination, which was performed in the majority of the cases. At all events, no further cases developed as a result of this exposure.

No less than 21 foci occurred, which could be definitely traced to Niagara Falls. This is well shown upon a map of New York State.

SUMMARY.

1. Smallpox had been present from time to time in Niagara Falls since 1908. (Records not sent to State Department of Health previous to 1908.)
2. Niagara Falls was well known to be an unvaccinated city.
3. Chickenpox was not reported to the State Department of Health until May 1914.
4. Smallpox was endemic in Niagara Falls from April 1912 until May 1914.
5. Chickenpox was said to be present in Niagara Falls in 1912.
6. In the years 1913 and 1914 the existence of smallpox was denied by many intelligent persons in Niagara Falls.
7. The Sanitary Code required the removal of all cases of smallpox to the quarantine hospital. Owing to the attitude of the city authorities this city ordinance could not be enforced.



SMALLPOX CENTERS IN NEW YORK STATE IN 1914.

——— Centers directly traced to Niagara Falls
.... Centers indirectly traced to Niagara Falls
• Centers, source of infection unknown

8. General vaccination did not begin until the second week of January 1914.

9. Cases of smallpox were not removed from their homes, nor was quarantine of houses rigidly enforced until January 1914.

10. Unvaccinated contacts in the same houses invariably contracted smallpox.

11. Vaccinated contacts did not develop smallpox.

12. Three weeks after compulsory removal and general vaccination began there was a steady diminution of the number of new cases reported.

13. General vaccination and immediate isolation, with the vaccination of contacts, is the only adequate method of controlling smallpox.

A word of appreciation is due Dr. F. M. Meader, Director of the Division of Communicable Diseases, and to Drs. Edward Clark, Chas. S. Prest and Otto R. Eichel, Sanitary Supervisors, for access to their reports, and assistance in preparing this article.

A RURAL SANITARY SURVEY AND WHAT IT REVEALS.

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Read before the General Sessions, American Public Health Association, Jacksonville, Fla., November 30–December 4, 1914.

IT IS with some diffidence I attempt a brief discussion of the topic, "A Rural Sanitary Survey and What It Reveals." Because so great in scope, at best only a few phases of the subject can be presented. One, therefore, may be taken to task, and rightly, for apparent emphasis on aspects discussed, and quite as logically censured for many things unsaid. But I trust you will realize I am endeavoring to portray the features of rural life which appeal to the sanitary officer as he makes his annual round in the counties of his jurisdiction.

Having lived a number of years in each of four of the Southern states, with a physician and health officer's opportunity for observation, I am familiar with the conditions which prevail largely in the rural districts of the section. I hope, in giving these impressions from personal experience, you will not think me pessimistic or disloyal to my own people.

On a recent tour of inspection early one cold morning in December, I stopped before the door—there was no gate—of a house a few yards back from the road. Only two of the rooms were roofed and weatherboarded, two others and a gallery being yet a skeleton; curtains of old blankets, unspeakably dirty, hung in the doors, while one side of the kitchen was open save for a curtain of cheap, thin calico, strung on a cord about four feet from the floor. The call of a stranger brought to the door and from around the house seemingly a dozen children and an untidy, hard-featured woman rather young in years. All were bare-footed and scantily clad. One child was munching a raw turnip and another, breakfasting, I assumed, on a cold sweet potato. Curious to know something of the manner of living of this family, I spoke to the children in a friendly way. They were shy, if not sullen, and the mother even less inclined to be communicative. She had a dull, listless expression and an air of apathy. I asked how long since they had begun to build. "Two years." "He" couldn't "get much time" to work at home. As there was a dearth of building material in sight, I thought there might be other reasons. Where had she lived before? She pointed to a hovel across the road, a dilapidated shack of one room unfit for a stable. There all her children had been born except the two youngest—she had been married seven years, had six children and it was apparent the stork's visit was not many weeks off. The others were "his."

"He was married before, twice." What did "he" do? "Logging when he could get it." Did the older children go to school? "No," they had no shoes, no books, and the oldest boy at home "had to help." "He cut wood." Had they a garden? "Yes, turnips" and some potatoes "to dig." What kind of water did they use. "A well." Was it good water? "No, sorter muddy." Were they ever sick? "Yes, chills." Did they send for a doctor? "No." I did not wonder at the unfriendliness of the children and the forlorn apathy of the woman. Sordid poverty, hunger and cold, were not conducive to cheerfulness, even on a bright winter morning. Do you think there are many homes like this? Drive from the highways into the unfrequented roads of the backwoods section and you will realize they are not few.

Having a week's work over a rather large area remote from a town of any size, to save time I elected to spend three days in one neighborhood and the remaining four in others adjoining, about ten miles distant, each in a different direction. The experiences of the week gave me an insight into the family life of a large portion of that section of the state.

The land was rated poor and in general cultivated by the owner. The farms were from forty to a hundred acres and poorly equipped. At the place which I selected as headquarters, every acre of cleared land—about thirty in all—was planted in cotton; around the house, there were three acres uncultivated. These had been set apart for a garden and pasture, but there were no vegetables except sweet potatoes and turnip greens and no grass except that, which of its own accord, had persisted in growing. There was a good cistern—new, unscreened—but no other convenience either within the house or outside. Six children slept in one of the three bedrooms; this was situated between two other rooms; it had two windows and a door opening on the gallery, but all these were closed and furniture placed against them. The only ventilation was by means of doors which opened into the other sleeping rooms. One room served as kitchen and dining room. Clothes were hung along the walls and behind the beds. Only two beds were furnished with mosquito bars.

The stock on this farm consisted of two horses, one mule and a number of "razor backs" (hogs) that lived on acorns in the woods and the fields adjoining the house. There were a few chickens but no cow.

Taking breakfast and supper here for three days, I had opportunity to study the character of the meals and the cooking. It was in September. On Sunday the menu consisted of chicken pie, sweet potatoes, turnips and dried apple pie with black coffee. At every other meal there were fresh pork and bread or potatoes; once, at night, a dish of greens, and once preserves. Fried pork was the main staple. I am quite sure this was cooked in my honor and that the family, when alone, lived largely on bread, potatoes and coffee. It seems pertinent to digress here long enough to say that the father of this family, though he chewed tobacco in huge quantities every day, seemed as "hardy as a pine knot," but he was the only one. Every child and the grown girls were anæmic and the baby was "chilling," the logical consequence of being constantly surrounded by a swarm of mosquitoes day and night.

If the members of this family desired to go "to town," or to a gathering three or four miles distant, they went in the wagon. Sometimes the girls' beaux took them in a buggy to church "meetings." I asked one morning how to get to a neighborhood about ten miles distant and not one in the family knew anything of the roads which led in that direction.

One evening, eleven of us went in the wagon to a meeting in a church two miles away. On the return trip we lost the "piney woods" road three times. One of the boys confessed he had purposely broken the only lantern they owned, his reason being he was "mad with the girls."

This family was thought of by many of the "settlement" as "well to do." The children went to school, the girls had lace waists and the old man always a plentiful supply of plug tobacco. There was prestige, too, in the fact that one of the young ladies sent "notes" to the county paper.

The other homes of this section where I spent the night and had two meals, supper and breakfast, were similar in type to the one described. Conveniences were lacking and the meals without variety and poorly cooked.

On a similar trip later in the season, I had occasion to go even into more remote neighborhoods. One of the homes in which I spent the night was an illustration of another type of rural residents. The family consisted of the man and his wife who fifty years ago had built their cabin home among the sand hills which overlook the river. The log foundation of the two original rooms was as solid as the day it was laid; through the cracks between the logs which formed the sides of the house the cold raw wind came in gusts—as it had for half a century. Two rooms and a hall had been added, but they were yet unfinished and there was no provision for heating except one fireplace in one room. The kitchen stove was the only piece of equipment which could be called a convenience. The meals were execrable and cleanliness evidently an unknown concept. The girls and boys reared in this comfortless home had gone from the roof tree. Nothing on or around the place looked virile except the old couple themselves and one magnificent pear tree. They said the old man was wealthy. I did not see the source of his wealth—stock raised in the river bottoms—but I wondered at the bondage of habit which had kept these people from realizing the unnecessary hardships daily endured.

It is a pleasure to add that on another trip of ten days I had opportunity to see the typical farmhouse of a different section where land is better and equipment more adequate. Food was more plentiful, in greater variety and better cooked and served, but even in these homes—I saw over twenty—there were no household conveniences to lighten labor, and a bath room in one only.

Do you see the pictures? The man, ignorant, shiftless, irresponsible, untrained,—husband to a third wife and father of many children? The home—if such it can be called—without comforts, the wife and children without sufficient food and clothing and, perhaps most important, without hope of betterment.

Do you see as I saw them, the second family another type, poorly nourished, bare-footed, picking cotton in the early morning that cheap finery might be bought "at the store." Drudgery in the home, the mother cooking, cleaning, sewing, washing, ironing, bringing water from the barnyard and wood from beyond the pasture and keeping in mind the two young children, one of whom must have four doses daily of the patent medicine on the mantel. With the ideal, not comfort but show, the girls would pick cotton in the part of the field where they could not be seen, but they would not plant and tend a garden. They would gossip about the ignorance of their neighbors, but would not help the younger children with lessons.

And the other home—a bank account, but no curtains; food in plenty, but gross ignorance in its preparation and serving; opportunity for construction of a comfortable home and sanitary appurtenances and no desire for surroundings other than those which habit alone made endurable?

Do you see the home of the better type with the parlor-bedroom with an organ, a gaudy lamp and a cuckoo clock, with pretensions of many kinds, yet only a tin pan on the back shelf and a bowl and pitcher on the front gallery as potential bathing facilities? With food cooked in quantities, but covered with a swarm of flies?

For those of us who attend meetings such as this, who are accustomed to the luxury of a daily bath, who it may be have never spent a night in a shed-room with windows and doors shut; who never had to draw thirty buckets of water in a day, or cut enough kindling to start the morning fire, these pictures may not mean anything. We cannot sense the inconveniences of such a manner of life. But that these conditions, unfortunately for public health and individual comfort, widely exist is undoubtedly true. The rural sanitary survey reveals features which I have not touched. In many sections a water supply from a shallow well, a spring in the hollow, or a cistern never cleaned; houses which in construction violate every principle of comfort and hygiene; an appalling lack of conveniences which common decency requires, a food régime which is as poor as ignorance can make it, and a faith in "cure-alls" beyond belief.

We might as well face the facts of a survey. It reveals the stable yard and other filthy conditions, breeding places of flies; the well in the worst possible situation as to drainage; no closets; little, if any, provision for personal privacy or personal cleanliness, and habits which make for communication of disease from one member of the family to another.

This is a condition. For us it matters not whether there are a great number, or a minority of people, leading this manner of life. Our obligation is to seek to remedy; to get at the root and aid in a substitution of ideals and standards which will lift to a higher plane not one class, but all. No easy task and one not to be accomplished in a generation.

It is impossible within the limits of this paper, as I have already suggested, to discuss the constructive phases of this condition. They are economic and social and in a few localities, racial, because of difference in stock inheritance and traditions.

It is evident that American rural life has been for some time in a state of transition. The oldtime pioneer farmer is passing; cheap lands are disappearing. As compared with very early days the farm population in some sections is better housed, better fed, better educated and informed, and provided with better implements and agencies with which to work. Farm women, too, in some states, have less arduous labor than that which formerly fell to their lot. Throughout the South there has not yet evolved a system of the small farmer, independent and well to do, neither does the old plantation system with its comforts and luxuries widely obtain. The South, more nearly in the beginning transitional stage than other sections, is therefore backward in production and transportation, therefore backward in methods of living.

Progress in the economic features of community life means progress in the social; they are interrelated; but advancement, either economic or social, depends on growth or evolution of many kinds. This precludes the hope that you or I or any organization can do very much toward the substitution and acceptance of higher standards by the adult population. In a democracy, the people accept whatever appeals to them as pleasing or useful; in a country governed by a monarch, acceptance of measures is implied. It is easier in the latter to abolish a custom detrimental to health or to substitute the sanitary for the insanitary. It doesn't matter so much in the older countries whether the people accept a new point of view; but here it is the all-important element of a change of action. Ideas direct activities and conduct. Ideals of life and action are among the most dynamic forms of ideas, therefore, the viewpoint of the resident of the rural home is the key to regeneration. It follows that the school is the institution to which we must look. Proper standards of living must be instilled into the minds of the children and training given in habits both of thought and action. In this our rural schools heretofore have failed. They did not recognize properly their whole function. At present, in many states, schools of the rural districts are being reorganized; effort is being made to adapt the course, the teaching and the subject-matter to conditions. It will require long and patient experimentation before a system entirely fit can be established, for it must embody the cultural as well as the vocational; it must apply the universal to the unit; and it must keep the ultimate in sight yet not lose in practical adaptation to the needs of the present. No people in the world's history ever grappled with a greater problem.

As the schools grow progressively in adjustment, successive generations will have the higher standards. But while this transformation as an outlook is encouraging, we cannot but realize the dire need of present action. Why can we not teach the farmer and his wife the danger of the use of Peruna, Swamp Root, or Madam Winslow's Soothing Syrup? Why can we not reach the rural home with the good tidings of how to escape typhoid fever, hookworm disease, or malaria? If we can, the obligation is ours.

To work effectively there should be a constructive program. It must be based on knowledge of conditions as they exist. Every feature of the situation should be considered, this to include the psychology of the people. With adequate information, it would be possible to fit activities to conditions, for example, in one section, water; in another, malaria; in a third, food—whatever would disclose itself in the individual community as allied to any conscious social activity now in progress.

From records of surveys already made, we know in general of two points of attack, namely, the crass ignorance which obtains as to necessity for sanitary disposal of waste, and the almost universal habit of taking "dope" medicine. That there are hundreds of homes in the rural districts without a closet, sanitary or otherwise, is a fact. If we knew the why of this condition, we could prescribe the remedy. Once I asked an old gentleman, who had a good home and a large and profitable farm, why he had not built a closet. After an embarrassed silence he answered, "We don't have them things." He looked as if I had touched a subject beyond the bounds of respectability; as if he thought a man who was a church member should not speak of so vile a subject, yet in this home there were seven people, one being a young man, principal of the school, and another the young lady assistant-teacher. I have often wondered since if this isn't the attitude of mind of many people who have never known of the sanitary conveniences required by just common decency.

Whether this be true or not, it is certain that the average man and woman of the rural districts—and unfortunately, many people in villages, even cities—are absolutely ignorant of the menace to health implied in this form of carelessness. Moreover, they are not easily convinced. They think a spell of diarrhea in the early spring is as natural a phenomenon as the sprouting of seed planted; they think a case of typhoid now and then "the will of God"; they are sure the connection of flies with intestinal disease too far-fetched for any one to believe and that doctors just lack common "horse" sense, which every man in the country is endowed with in greatest abundance. Again, the remedy lies in the training of children. No country school should be permitted to open until there is an adequate number of sanitary closets for both boys and girls. The children becoming accustomed to the physical comfort which results, will be effective teachers in the home. Doubtless, the law of every state gives to the proper school or health officer authority to require this, but they do not feel the obligation to enforce.

The patent nostrum evil is more difficult. In many instances, it is a habit, unconscious it may be, but nevertheless a habit. The man or the woman accustomed to the effect of a "dope" drink wants to believe that it is relieving pain or assisting nature. The pleasant sensation is an incident which lightens the routine of a dull, monotonous day. I see no way to put out of business these partners with poverty and death but to enlist in the cause the country editor. If he could be persuaded or made to cut out the advertisements of quack remedies and paid to run a half column each week of pertinent, reliable information on the so-called remedies most used in his territory, it would be effective to a degree. In Louisiana we have toured the state to take from the shelves of stores all medicines containing habit-forming drugs, except plantation stores distant from a town, and we insist that every drug store employ a registered pharmacist and keep a poison register. The control, however, of use of patent medicines is largely in the power of the practitioner. He is the main factor in the education of the people as to harmful results and folly of spending money for these concoctions of alcohol, burnt sugar and other substances with no therapeutic value.

It is conceded that among rural people leadership is notably lacking; there is no organization which can be relied on and no idea of social responsibility. Who then can lead in a movement for betterment? The county health officer and the doctor. It is within the authority of the health official to demand certain requirements in the interest of public health and for the protection of the individual. Health work touches intimately the family life in every phase; and it is so personal in many aspects that one with authority like the health officer, or with influence such as the physician has, can teach acceptably and by practicable application just what the farmer, his wife and his children need to know.

I believe much could be done through the villages to hasten the day of sanitary enlightenment in the country. In these small communities the proximity of the people gives to their actions something more than personal significance, yet often this is not recognized. Our villages are permitted to ignore their serious community problems. The streets are dirty, water and food unprotected. They do not obey the sanitary law, yet nothing is done. The farmer, when he goes to the post-office, sees nothing to inspire him to improve conditions at his own home. If, on the contrary, he found in effect those regulations concerning health illustrated, he could not escape a lesson in hygiene.

Again, this is within the purview of the county health officer. But the broadening of the outlook of the resident of the rural district is not the obligation of one man or one profession. The duty is shared by the church, the sociologist, the teacher, the minister, the welfare worker, in fact by all who bear responsibility because of position or knowledge. Where to begin is a point to be considered by each institution or worker in his own locality, but that each should do his part admits of no discussion.

I would fail in justice to conditions if I did not emphasize again that progress is being made, but I should fail also in justice to those who today endure suffering and hardships, if I did not repeat that we, physicians, are called to action—to do what we can now to remedy whatever is remediable, further to lend intelligent assistance it may be to lead, in the constructive development of this factor of our national life.

STATISTICS OF DISEASE.

THEIR SOURCES, USES, AND LIMITATIONS.

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Read before the Section of Vital Statistics, American Public Health Association, Jacksonville, Fla., November 30–December 4, 1914.

IN considering statistics of disease we have become accustomed to include mortality statistics with morbidity statistics. Morbidity statistics are obtained by the compilation of data relating to cases of disease, and, as disease is present wherever there are cases, morbidity statistics relate to the prevalence and geographic distribution of disease and the conditions under which it occurs.

Mortality statistics are the statistics of deaths. They are obtained by the collection and numerical classification of data relating to the frequency of deaths, their causes and the conditions under which they occur. Most deaths are caused by disease; and, in so far as they are thus caused, mortality statistics relate to those cases of disease which terminate life. To illustrate, in a city in which there had been 500 cases of typhoid fever, of which 45 had terminated fatally, morbidity statistics would treat of the facts relating to the 500 cases, while mortality statistics would include data relating to the 45 deaths.

MORTALITY STATISTICS.

Of the two classes of statistics relating to disease those of mortality are the older. They were developed first because they serve a number of essential purposes and are a necessary part of the bookkeeping of every well-organized community. Among other things mortality statistics show the losses in population caused by death and, in the absence of morbidity statistics, serve as an indication of the prevalence of certain diseases. Because of the latter function they have played an important part in the development of present-day public health administration by showing the need for the conservation of life.

LIMITATIONS OF MORTALITY STATISTICS.

In using statistics of any kind it is always necessary to bear in mind their limitations and the degree to which they actually represent the conditions to which they relate. Like other statistics, those of mortality consist of the numerical compilation and classification of certain data. The compiled statistics cannot be more accurate then the original records from which they are derived. Mortality statistics cannot be more accurate than death registration. A compilation of errors or misstatements will not produce a tabulation of facts. Some of the obstacles to satisfactory mortality statistics have been removed. Others are left for the future to deal with. Though more backward than some countries as to mortality statistics for the nation as a whole, the United States has made signal progress during the last decade, and for much of this the gratitude of all is due to the perseverance, far-sightedness, diplomacy, and singleness of purpose of Dr. Cressy L. Wilbur.

Mortality statistics cannot be more accurate than the data recorded in the individual death certificates. With the exception of the statement of the occupation of the decedent the personal and statistical particulars usually furnished by some member of the family are undoubtedly in most instances accurate. As to showing the exact kind of work, statements of occupation suffer because of the indefiniteness of many of the terms commonly used. This is due in some measure to the fact that the nomenclature of occupation in common use has not progressed apace with the rapid development of new industries and industrial processes and methods. Whereas, 50 years ago the statement of occupation might have been in most instances comparatively simple and easily understood; today, with changed industrial conditions, the matter requires greater precision, if useful statistical information is to be obtained.

From the standpoint of public health administration undoubtedly the most important item in mortality statistics is that relating to the cause of death. Unfortunately, the statistical data relating to this particular are generally among the least dependable. Very probably every community in its development of death registration must pass through an early period when it does not receive the conscientious coöperation of the practising physicians and during which many of the physicians do not attempt to record the actual causes of death. It must then pass through a period when the physicians are becoming gradually educated as to the need for and the proper method of stating the causes of death for the purposes of death registration. After these developmental periods have been passed the death certificates and the derived statistics will show the true causes of death to the extent that the physicians themselves know the true causes. From this time on the statistics of causes of death will depend upon the training and diagnostic acumen of the practising physician. They will depend upon medical education and the development and use of diagnostic methods. In many of the older communities and in those where the practising physicians have received what is at present considered a good medical training, undoubtedly the actual causes of death are given in most cases of the more easily diagnosed conditions. As regards the less readily diagnosed conditions this is without doubt not true.

Comparing Incomparable Data.

So much for the elements which have a tendency to inject numerical inaccuracies into statistics of deaths. The improper use of mortality statistics is a thing of frequent occurrence. Unwarranted conclusions are being drawn almost daily by those who, while not thoroughly understanding the nature of the statistics, nevertheless, make use of them as a guide for action, or an authority in argument. One of the principal errors made is the comparing of data which is incomparable because dissimilar. The data may be incomparable because the original records were dissimilar, or because of different methods employed in their numerical compilation and classification. Mortality rates arrived at by lax enforcement or faulty methods of registration cannot properly be compared with those based upon complete registration, nor can the rates of communities with populations of different sex and age composition be compared unless proper allowanees be made and the rates expressed in terms of the same population. It is improper to compare the mortality rate of an aggregation of young men picked for physical soundness, such as an army or navy, with the crude or general mortality rate of a civilian population. We would come nearest to the possibility of making a comparison by comparing the rate of the picked body of men with the rate among men of the same age groups in the civil population. But this would not be an entirely fair comparison either, for the one group would consist of men especially picked for physical fitness, while the other group would include the fit and the unfit, the strong and the weak. Nor is it possible to compare the mortality rate of any special population group with the rate of the population from which it has been derived by intentional or unintentional processes of selection unless the differences in population composition are analyzed and considered. To illustrate, it would be utter folly to compare the mortality rate of New York City, or the registration area of the United States with that of the Canal Zone without taking into account the differences which may have been produced in the age and sex compositions of the two populations by the selective processes naturally operating in the instance of the Canal Zone. One who attempted to compare these populations without an analysis of the population composition would be almost sure to arrive at quite erroneous conclusions. This is a case where the statistics in themselves might be accurate but would suffer in reputation because of the methods of the user.

Another illustration which may serve to make the point still more clear: Little would be gained by comparing the general mortality rate of one of the older American cities or states with that of a pioneer mining community in which there were relatively few women and children unless the comparisons were based upon analyses of the age and sex composition of the respective populations.

The standardizing of population as to age and sex is necessary for purposes of accurate comparison. This is true, not only in death-rates, but in morbidity-rates and birth-rates as well.

MORBIDITY STATISTICS.

Morbidity statistics have not as yet been developed to the same extent as mortality statistics. This is due in part to the difficulty of securing satisfactory records of cases of disease from which useful statistical compilations might be made. While it is comparatively easy to obtain records of deaths by control over the disposal of dead bodies, it is quite different with cases of sickness. Many physicians and some statisticians have for a long time realized the extreme importance of comprehensive morbidity records and statistics to the progress of medicine and to public health administration. It is only with the advent of the present widespread interest in the conservation of the health and life of man that especial attention has been given to the subject.

As a part of the existing and growing interest in social betterment, public health administration—the prevention of disease and the conservation of health—will play an important rôle, and inseparably linked with it will be better records of the occurrence of sickness and morbidity statistics. To social workers within health departments, and without, the future will in all probability owe the giving to statistics of sickness and disease the attention they deserve.

USES OF MORBIDITY STATISTICS.

Morbidity statistics are derived mainly from the reports of cases of sickness made by practising physicians. The records thus made are essential for the protection of the health of communities. For the communicable diseases these reports show the occurrence of cases which constitute foci from which the disease may spread to others. In some diseases they make it possible to see that the sick receive proper treatment. In occupational diseases they show the location of conditions that are causing illness or injury. In diseases controlled by sanitary measures they show the relative efficiency of such measures and the need for their modification. And finally, the data of morbidity reports when compiled become morbidity statistics and show the past occurrence of disease, its relative prevalence from year to year, at different seasons, and under varying conditions.

LIMITATIONS OF MORBIDITY STATISTICS.

Morbidity statistics suffer in completeness at the present time mainly because the recording of the data from which they are derived depends upon the coöperation of practising physicians, who at times coöperate grudgingly, if at all. Without doubt, however, the physician will coöperate when public opinion looks with disfavor upon the practitioner who endangers the welfare of the community by his neglect to furnish the records of disease required by law for the protection of life and health.

In Russia, physicians are required to report on all cases of sickness and disability they attend. In most other countries reports are required of only those diseases which the health authorities attempt to control. For the most part these are limited to the communicable diseases, and it is to these that such morbidity statistics as we have relate.

The inaccuracies in morbidity statistics are due principally to incompleteness, that is, to the failure of physicians to report all cases. This causes the number of cases recorded to be less than those that actually occurred. More cases of disease invariably occur than appear in the records. This is, and will continue to be, for many diseases an inherent limitation. Many diseases vary in severity under different conditions, and some cases are so mild, or so atypical, that their true nature is not recognized. Then, too, many cases do not come to the attention of physicians. Neither statistics of disease nor of the causes of deaths can progress in accuracy beyond the ability of man to recognize individual morbid conditions.

The cases notified, however, are usually correctly diagnosed, for physicians very rarely report cases until they are practically sure of the diagnosis. This is so because the obligation for reporting a case is usually not mandatory until the nature of the disease has been ascertained, or at least suspected, and because when a physician reports a case with an incorrect diagnosis the case remains as an evidence of his mistake.

The common error, therefore, of morbidity statistics is one of numerical incompleteness. In this they resemble birth statistics, the usual defect of which is also one of incompleteness. It will be noted that the nature of the usual error in morbidity statistics is quite different from the usual error in mortality statistics, for in mortality statistics, by exercising control over the disposal of dead bodies, it is not difficult to secure in most communities practically complete registration of deaths. It is, however, exceedingly difficult to secure correct statements of the causes of death. The physician feels compelled to record a diagnosis in each death certificate and he invariably does so even when he is quite uncertain as to the nature of the fatal malady.

The tendency is then in morbidity reports for the diagnosis to be correctly given, but not all cases reported, while in the registration of deaths the tendency is, on the other hand, for the recording of practically all deaths, but the filing of many incorrect statements of the causes of death. It is quite probable, therefore, that our morbidity statistics for those diseases which have been notifiable for some time, and to the notification of which physicians have become in a way accustomed, are at the least relatively as complete and give as true an account of the prevalence of cases of these diseases as the average mortality statistics do of the occurrence of deaths from individual causes.

The following table shows the number of cases of certain diseases reported in a number of selected cities and states for each death recorded as due to the same disease during the same period:

TABLE SHOWING THE NUMBER OF CASES OF CERTAIN DISEASES REPORTED FOR EACH DEATH REGISTERED AS DUE TO THE SAME CAUSE IN A NUMBER OF SELECTED CITIES AND STATES.

	Cases reported.	Deaths registered.	Number of cases reported for each death registered.
DIPTHTHERIA:			
Year 1912.			
District of Columbia	393	15	26
Utah	328	23	14
Year 1913.			
District of Columbia	530	26	20
Birmingham, Ala.	145	3	48
Spokane, Wash.	47	1	47
Minnesota	3,073	209	15
MEASLES:			
Year 1912.			
District of Columbia	1,638	7	234
Utah	3,117	15	208
Year 1913.			
Denver, Colo.	746	3	248
Grand Rapids, Mich.	2,124	9	236
Spokane, Wash.	237	1	237
District of Columbia	5,713	25	228
Montana	2,094	17	123
SCARLET FEVER:			
Year 1912.			
District of Columbia	259	4	65
Utah	1,024	18	57
Maryland (exclusive of Baltimore)	608	13	47
SCARLET FEVER:			
Year 1913.			
Dayton, Ohio	146	1	146
Louisville, Ky.	576	6	96
District of Columbia	556	13	43
Utah	1,020	15	68
Maryland (exclusive of Baltimore)	822	23	36
TUBERCULOSIS:			
Year 1912.			
Maryland (exclusive of Baltimore)	3,262	1,045	3.1
Virginia	4,624	1,435	3.2
Michigan	6,423	2,731	2.3

TABLE SHOWING THE NUMBER OF CASES OF CERTAIN DISEASES REPORTED FOR EACH DEATH REGISTERED AS DUE TO THE SAME CAUSE IN A NUMBER OF SELECTED CITIES AND STATES.—*Continued.*

	Cases reported.	Deaths registered.	Number of cases reported for each death registered.
Year 1913.			
Seattle, Wash.	633	198	3.2
Milwaukee, Wis.	974	340	2.9
Boston, Mass.	3,487	1,260	2.8
Maryland (exclusive of Baltimore)	3,299	1,122	2.9
TYPHOID FEVER:			
Year 1912.			
Virginia	4,330	260	16.6
Utah	549	57	9.6
Maryland (exclusive of Baltimore)	1,795	227	7.9
Year 1913.			
Paterson, N. J.	115	4	28.7
Fall River, Mass.	139	12	11.6
Cincinnati, Ohio	266	24	11.1
Utah	973	90	10.8
Maryland (exclusive of Baltimore)	2,984	306	9.7

THE SANITARY CONTROL OF SHELLFISH INDUSTRIES.

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Read before the Laboratory Section, American Public Health Association, Jacksonville, Fla., November 30–December 4, 1914.

ONE of the most interesting and important problems of the sanitation of food products, now before food officials and those interested in sanitary conditions, is that of the sanitation of the shellfish industries. The oyster, clam and scallop industries are of the greatest importance, and of these the oyster trade is the largest. How to control this industry from a sanitary standpoint and at the same time conserve this valuable food product has been a matter of discussion for some time.

Several procedures have been presented by which this industry may be placed under sanitary control. Two methods are preëminent among all others; by one, seizure is made of the product and criminal proceedings are instituted against the shipper or dealer; by the other, food officials coöperate with the industry in the determination of the polluted areas of oyster grounds and local, state and government officials coöperate with one another and with the industry to prevent the use of oysters from these polluted areas, until such time as examination shows the localities to be free from pollution.

A comparison of these methods at this time may be of interest. It may be said that the method of seizure of the goods and criminal proceedings have to do solely with individual shipments. This procedure serves to prevent some material of a polluted or decomposed nature from reaching the consumer, and holds the dealer or shipper responsible for the shipment, rendering him subject to a fine or imprisonment. In oyster localities, however, there are generally a number of shippers or dealers using material from the same locality. All of the material may be of the same character and subject to the same conditions of sanitation. To regulate or control the industry by the method of seizures and criminal procedure would necessitate the services of a large force of men, both for inspection and analytical work. Without such a force it would be possible to effect the seizure of only a percentage of the shipments and to permit the remaining shipments to reach the consumer. The result, therefore, of seizure and criminal procedure is a control only of individual shipments or dealers. This method, however, has the effect of placing a feeling of uncertainty in the minds of the shippers and serves to make them cautious as to the locality of oyster ground from which the proper material may be shipped.

In controlling the industry by the coöperative method, systematic examinations of the oyster beds and of the water influencing the same are made. As a result of these examinations results are obtained from which definite knowledge is secured whereby it can be shown that within certain localities it is inadvisable to take oysters on account of the amount of sewage or polluting material in that section. Having secured this information, it may be used to prohibit the taking of oysters within these localities until such time as examination shows the product to be in an acceptable condition. By this means, it is possible to control all of the material coming from a given locality, whereas by the other method only a single shipment from the same locality may be seized. By such systematic examinations it is possible to control all of the material originating in the various localities of the country. This method of control has been successfully tried by various state officials and the Federal Government. Of the states controlling the shellfish industry by this means, Rhode Island, New York, New Jersey and Virginia are foremost. Assistance has been given by Federal officials to the states wherever possible.

As an illustration of this method, it may be of interest to note the procedure of the Bureau of Chemistry with regard to sanitary control. When a given locality in which to conduct the investigations has been decided upon, a series of sampling stations is established, located with regard to possible sources of pollution shown by inspection of the locality. Two series of samples are secured, the first, taken generally in the channel of the stream, is for the purpose of studying the effect of dilution or purification on the polluting material. Examinations are conducted from both bacteriological and chemical standpoints. A second series includes samples of oysters and water. The oyster samples are taken at about equal intervals in passing down a stream and at such points as are representative of the locality as far as is possible. At the same time a series of water samples is collected from the water over the various oyster beds. This series helps to show the effect of any polluting material upon the oysters. Bacteriological and chemical examinations are conducted on the water samples and bacteriological examinations on the oysters. At the time of collection of the samples full notes are kept as to the conditions of tide, temperature of the air and water, wind, inspection of the shore, etc. The results are tabulated and reëxaminations are made at regular intervals, generally one month apart.

When an investigation has been conducted in this manner and the results are tabulated, conclusions may be drawn from the information so obtained as to the extent of the pollution, the effect on the oyster grounds, climatic changes, the influence of tides, wind, temperature, etc. At the time these conclusions are reached those interested are informed as to the findings, with especial stress laid on the fact that oysters should not be used for trade within the time limits in which they show marked pollution. If, however, they are used for trade, then seizures are made and criminal proceedings instituted.

By this method the trade is acquainted with conditions surrounding the oyster-growing localities. In giving this information and laying stress on the fact that oysters should not be used from the polluted areas, without cleansing, a warning is given to the trade. Wherever the warning is not sufficient, legal measures may be adopted. When such conditions are brought to the attention of the courts more severe punishment would be given than in case a warning had not been given.

When polluted areas are found, measures are suggested for the use of the oysters and the conservation of their food value. It is suggested that polluted oysters be floated in non-polluted water of the same salinity as that in which the oysters are grown for a sufficient time to allow the oysters to cleanse themselves, or the transplanting of the oysters to non-polluted areas for the purpose of cleansing. Either method serves the same purpose, that of cleansing the oyster of the pollution.

The results obtained from such systematic examinations may be used from time to time in securing means of removing or treating the sewage or polluting material. As a result of examinations already conducted by this method, sources of pollution have been brought to the attention of the proper officials. Wherever attempts have been made to install sewage-disposal plants or to bring about other legislation aiming to prevent stream pollution, the results of such systematic examinations are of great value.

This season has shown the results of a coöperative procedure as outlined in that the direct sale of oysters from one of the worst polluted areas of the country has been practically discontinued as far as the Bureau of Chemistry has jurisdiction. The success of this method is not limited to a single section but is observable in several localities where the procedure was followed. In this way the sale of oysters from questionable localities has been controlled satisfactorily.

Such control, if general, would protect the public from any possibility of danger from the use of shellfish from polluted areas and do so in a manner which would gain the confidence not only of the public but the dealers and producers as well. For the successful carrying out of the method, coöperation must be instituted between local, state and government officials and with the trade. If this method of control is followed the aims of officials will be fulfilled and the oyster food conserved for the public.

LABORATORY METHODS IN THE DIAGNOSIS OF TYPHUS FEVER.

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NOT until 1912, when Anderson and Goldberger,* showed that so-called Brill's disease was identical with typhus fever, was it recognized that the disease was of possible significance in our morbidity reports. Since the publication of their first paper reports have appeared from widely separated sections of the United States showing that typhus fever is practically endemic in certain of our larger cities and frequently occurs in smaller cities and towns, and even in rural communities.

This has not been because of the sudden development and spread of the disease, but because physicians have had their attention called to the disease and have therefore been on the watch for cases with the clinical features of typhus, cases which previously they were inclined to regard as "atypical" forms of typhoid fever or other diseases.

With this increase in the number of reported cases has come a demand from the clinicians for aid from the laboratory worker in diagnosis. This aid from the laboratory has been, up to the present, largely of a negative character and we are still dependent to a large extent in our diagnosis of typhus fever upon the clinical features of the disease. Nevertheless, certain laboratory procedures may be employed which are of material assistance in the diagnosis of typhus fever.

These procedures may be divided into those which are of value (a) because of the negative findings and (b) because of the positive findings that may be obtained. We may now consider these in detail:

(a) Of special value are a positive Widal reaction, positive blood or feces cultures showing the presence of organisms of the typhoid group, or positive cultural and microscopic findings from the fluid obtained by spinal puncture. Should any of the above findings be obtained, typhus fever may be excluded and for that reason such studies should be made when it is not possible to carry out the procedures to be discussed under (b).

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* Anderson, John F., and Goldberger, Joseph: The Relation of So-called Brill's Disease to Typhus Fever. An Experimental Demonstration of their Identity. Public Health Reports, 1912, 27, 149 (Reprint No. 74).

(b) The laboratory methods that may be employed, positive findings in any one of which justify the making of a diagnosis of typhus fever, are the inoculation of guinea pigs or monkeys with blood and blood cultures, using the special technique as suggested by Plotz.* Elsewhere† I have suggested the inoculation of guinea pigs with blood from cases of suspected typhus fever as of special value in the diagnosis of the disease. It is sufficient to inoculate intraperitoneally, a pair of guinea pigs weighing about 500 grams with 3 to 4 cubic centimeters of either whole, or defibrinated blood drawn during the febrile period. The rectal temperature of the animals should be taken twice daily and the temperature plotted on a chart. It is important that regularity be observed in taking the temperature, so that it is taken at the same time hours each day. Observations should be continued for at least three weeks.

As I have discussed in another paper ‡ the reaction of the guinea pig to typhus, it is necessary to mention here only one or two points. The sole indication of a reaction by the guinea pig to the virus of typhus is manifested by a temperature curve which, in its rise, duration and fall, presents certain features that have come to be considered as characteristic. Unfortunately, as has been shown elsewhere,‡ all guinea pigs inoculated with blood from cases of typhus fever do not react to the virus, and therefore a negative reaction does not necessarily exclude typhus.

On account of their cost, the use of monkeys is more limited than is that of guinea pigs; but, when they are available, the procedure is practically the same as with the guinea pigs.

Plotz* has reported the cultivation of an organism, using special methods of anaërobic culture, from cases of so-called Brill's disease and of European typhus fever. An identical organism was obtained from both. Should his observations be confirmed, we will then have at our disposal a laboratory method of diagnosis of value equal to that of blood cultures in typhoid fever.

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* Plotz, Harry: The Etiology of Typhus Fever (and of Brill's Disease). Preliminary communication. J. A. M. A., 1914, 62: 1556.

† Anderson, John F.: The Problem of Typhus in the United States. J. A. M. A., 1913, 60: 1845.

‡ Anderson, John F.: The Reaction of the Guinea Pig to the Virus of Typhus Fever. Jour. Med. Research, 1914, 30: 467.

REPORT OF COMMITTEE ON COLD STORAGE, AMERICAN PUBLIC HEALTH ASSOCIATION.

Read before the General Sessions, American Public Health Association, Jacksonville, Fla., November 30–December 4, 1914.

YOUR Committee begs to state that since its last report very definite progress has been made in legislation for the regulation of cold storages and cold storage products.

1. The National Commission of Uniform Laws have agreed upon the bill which is to be brought before the Committee of Congress this year (as well as probably before different legislatures), while the federal government of Canada has passed "An Act to Regulate Cold Storage Warehouses."

2. While this Association will be gratified to know that such legislation is to some extent the outcome of the efforts of its Committee, yet it will see by reference to the clauses of these bills that the whole meaning of cold storage from the public health standpoint has not yet been grasped by the framers of these bills. Thus in neither act is fruit, or indeed any vegetable food, included among foods liable to inspection in cold storage. "Articles of food" in the American bill includes "Fresh meat and meat products, fresh food fish, game, poultry, eggs and butter," while the Canada act includes meats (except meat in process of manufacture) or fish, poultry, eggs and butter. The Canadian act includes, however, the valuable provision "and such other foods as may be designated by order in Council," which of course can be made to include fruits, etc.

3. Both acts are defective and crude in their attempts to define cold storage. The American bill says: "Cold storage shall mean the storage of articles of food at or below a temperature of 45° F. in a cold storage warehouse"; while the Canada act says: "Cold storage means the storage of articles of food at or below a temperature of 40° F. in a cold storage warehouse."

Your Committee submits that a clause ought to be added to such definition as the following: "The term 'cold storage' shall apply to any cold-producing process which keeps any designated article of food at such temperature as will maintain it in the highest state of wholesomeness."

4. The subsequent provisions of the American bill are comprehensive and are intended to prevent evils which, through the lack of knowledge and in the absence of inspection, have grown up alongside the development of the cold storage business. The Canada act, without giving specific details, provides that "Orders in Council may be passed to deal with the several matters specifically treated in the bill." Each method has its

advantages and illustrates different methods of legislation. Each provides for:

(a) Licensing cold storages.

(b) The inspection of cold storages, the former providing for revocation of license if insanitary conditions are not corrected.

(c) For keeping records of the date of placing in storage, period of storage, and date of removal.

(d) For appointing inspectors.

(e) For ensuring that all food is wholesome at the time of placing in storage; but the Canada act is defective in stating that the act applies only to foods in storage longer than 21 days, which is akin to the proviso in the American bill which permits articles if cold stored for less than 30 days to be sold without the cold storage label.

(f) Marking all packages plainly.

(g) Fixing length of period of storage for different foods and the extension of periods, after inspection by government officers.

(h) To prevent re-storage of articles once removed from cold storage if once exposed for sale.

(i) Making regulations for carrying out the work is common to both acts.

(j) Both acts have provision for fines and imprisonment.

5. Now that so much is known with regard to the best methods of handling the various foods in cold storage it would seem that such clause as (g) could with advantage be replaced by something such as this: "That the period of time during which any article of food can be legally kept in cold storage will be determined by its keeping qualities, its actual condition at any time of inspection and the seasonal scarcity of the article as set forth in regulations under this act."

With experts increasing constantly in knowledge, experience and numbers, it ought not to be difficult to have a commission selected from state, federal and municipal officers, professional chemists and bacteriologists, and from persons engaged in the business to report on these most important points; while this Association might very properly by resolution direct the attention of the federal governments of the different countries and those of states and provinces to the need for the standardization of periods of storage for each individual article of food, based upon experiments.

(a) As to changes in normal tissues with different lengths of time of storage.

(b) Formation of decomposition products in tissues injurious to health.

(c) The optimum temperatures at which the various articles are preserved longest without deleterious changes.

(d) The relative humidity at which each food maintains best its normal condition with minimum development of fungi, moulds or bacteria and with least loss of weight.

6. Inasmuch as the development of the ideal in cold storage methods means directly the conservation of the largest proportion of stored products, both as regards quality and quantity, and therefore has a direct relation to their marketable value, it is apparent that, with the ever increasing quantities of food products being placed in cold storage, no subject has a more direct relation to health, since it means both the saving of large quantities of foods, otherwise destroyed, in their most wholesome condition and the lessening of prices in those periods of ordinary scarcity when certain foods are produced in smallest amounts.

Respectfully submitted,
DR. WARD L. BEEBE,
DR. PETER H. BRYCE,
DR. W. F. SNOW,
F. D. BELL, *Chairman.*
Committee on Cold Storage.

REPORT OF THE COMMITTEE ON STANDARD METHODS FOR THE BACTERIAL DIAGNOSIS OF GLANDERS.

Read before the Laboratory Section, American Public Health Association, Jacksonville, Fla., November 30–December 4, 1914.

YOUR Committee is pleased to be able to record a considerable advance in knowledge regarding the diagnosis of glanders since its report of 1911. In that report, presented by Dr. W. L. Beebe as chairman, the following conclusions were reached:

1. That mallein is the most reliable practical method that we have of diagnosing glanders.
2. That the agglutination test is a very valuable aid in diagnosing glanders, and, in some cases, can be employed where conditions prevent the application of other tests.
3. Straus' method is reliable in clinical cases where a positive reaction is obtained in the guinea pig and *Bact. mallei* recovered in pure cultures from the lesions.
4. It is advisable to make cultures in suitable culture media, such as. glycerine potato, from the suspected material when Straus' method is employed.
5. Complement fixation is very reliable, but is probably too tedious and complicated for routine procedure.
6. Cuti-reaction and ophthalmo reactions with mallein have shown very poor results.

At the present time we possess several methods by which we are reasonably sure of diagnosing practically all cases of glanders. In the light of recent study and experience, however, the ophthalmic mallein test is now regarded as the most reliable and practicable for ordinary use, being more accurate and convenient than the subcutaneous mallein test which has been the most widely used for many years; while the combined agglutination and complement-fixation test is the most highly accurate method, though this, of course, is limited to laboratory use.

VARIOUS METHODS FOR DIAGNOSING GLANDERS.

In judging a method which would be the most satisfactory for the diagnosis of glanders various things have to be taken into consideration, but especially the reliability of the test. It should be convenient, the results should be manifested as early as possible, the reaction should be distinct and well-marked, and, probably the most important of all, it should be possible for the practitioner to apply the test. The last condition must be seriously considered, since his standing in the community and the confidence of the public in his work would be more manifest if in suspected cases he could personally decide on the diagnosis instead of having to depend entirely on the results of serum tests made at some distant laboratory.

It would require a great amount of space to enter into the history of the various methods of diagnosis and to enumerate the data we possess on the different tests. The advantages and disadvantages of the various methods, especially of the subcutaneous mallein tests, have been repeatedly published and are accessible to all those who are interested in the subject. There is no question that the subcutaneous mallein test is one of the valuable diagnostic agents for glanders, but no one can any longer deny that failures from this test are more numerous than are desirable. As a matter of fact, the uncertainty of the results from this test caused numerous investigators to seek some other method which might replace the subcutaneous mallein test. Besides the failure resulting in this test, the technic of executing the test, together with the time required for its determination, make it unpopular with many veterinarians and sanitary officers.

Of the other tests which from time to time have been devised for the diagnosis of glanders, the precipitation, the opsonic, and the conglutination tests will not be considered, since the results from these tests are not encouraging.

For laboratory tests the combined agglutination and complement-fixation test will no doubt remain the most satisfactory, and should always be applied in cases where doubt arises as to the results of other tests carried out by the practicing veterinarian. These latter should be considered as accessory tests, and provision should be made everywhere so that in case of doubt the serum could be subjected to the laboratory test mentioned, and the final decision should rest on its outcome.

THE OPHTHALMIC MALLEIN TEST.

During the last few years the ophthalmic mallein test has gained great favor in the diagnosis of glanders. The popularity of the test is rapidly gaining wherever it has been applied, and among its supporters we find at the present time the greatest authorities on the subject of glanders and on clinical diagnosis. This method of testing is at present officially recognized in Austria, and the indications are that ere long it will constitute the official test in other countries. The results obtained in Austria, where the test has been employed for several years, are very gratifying, and Professor Schnurer, of that country, one of our greatest authorities on glanders, claims that the control of the disease can be very satisfactorily carried out by the application of the eye test, supplemented in doubtful cases by the agglutination test. Bavaria has recently adopted this method of diagnosis for official testing. In Germany the method is also gaining in favor, and current veterinary literature contains expressions of satisfaction with this test from many German authorities. In the United States, the Bureau of Animal Industry, in consideration of the favorable results obtained, has recognized this method of diagnosis for interstate shipments of equines. The test has also been officially recognized by the Canadian authorities, and thus far no sanitary official connected with any of the states in this country has declined to approve this test.

The favorable results which have been obtained with this diagnostic method can no longer be denied. Its practicability is apparent, and its use in the control of glanders appears to be now an absolute necessity.

Simplicity of Procedure.

The ophthalmic test has a great advantage over others because of its very simple application. It may be readily executed by any veterinarian, and its other advantages are that the results are obtained in a comparatively short time and are, as a rule, distinct and definite. The simplicity of its application is plainly manifest when compared to the subcutaneous test, as it is only necessary to drop two to three drops of concentrated mallein into one of the eyes of the animal to be tested, or, by a still simpler procedure, to dip a camel's-hair brush into mallein and introduce this into the conjunctival sac of the animal. The reaction usually commences in 5 to 6 hours after the introduction of the mallein and lasts from 24 to 36 hours. A positive reaction is manifested by a purulent secretion from the tested eye. This may be very profuse or slight, sometimes associated with a severe conjunctivitis and edema of the lids, and at other times without any inflammatory symptoms being present. At times only a very small quantity of pus may be present in the inner canthus of the eye. At other times the reaction may manifest a true pyorrhea.

The reaction manifests itself in varying degrees in the animals, but the intensity of the reaction has no relation to the extent of the disease in the reactor.

Best Results with Raw Mallein.

The essential factor in obtaining satisfactory results from the test appears to be in the use of the right kind of mallein. It must be by all means a concentrated mallein, and apparently the best results follow the use of raw mallein, which, as a rule, represents the mallein obtained after the concentration of the filtrate from the bouillon cultures of the glanders bacilli. The ordinary mallein used for subcutaneous testing is not adaptable, and the failures which have been reported in the literature were without doubt, in the majority of cases, due to the fact that the mallein employed was not sufficiently concentrated. Marioth * correctly asserts that the reaction does not depend as much on the quality and quantity of the mallein as on its concentration. The experiments of the Chairman of this Committee, assisted by Dr. Adolph Eichhorn, in the Pathological Division of the Bureau of Animal Industry, in preserving such mallein with the ordinary quantity of 0.5 per cent. carbolic acid showed that it does not interfere with

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* Monatsh. f. prakt. Uerheilk., bd. 24, hft. 7/8, p. 340–373; hft. 9/10, p. 426–546. Stuttgart, 1913.

the results of the test, although the lacrimation which follows immediately after the introduction of such mallein is more profuse than when carbolic acid has not been added, but this disappears within one or two hours after the application of the test.

Preparation of the Mallein.

The concentrated mallein which has been used in the work of Mohler and Eichhorn and which gave such satisfactory results was prepared at their request by and in coöperation with Mr. A. M. West, of the Biochemic Division of the Bureau of Animal Industry, as follows:

The media consists of bouillon containing 5 per cent. glycerine, 1 per cent. peptone, and 5 per cent. NaCl. The reaction is that of the natural acidity of the meat, no acid or alkali being added. The flasks of media are inoculated with virulent cultures of *Bacillus mallei* and placed in the incubator at 37.5° C. for a period of two months or more. The stock cultures of *B. mallei* are kept on agar, and their virulence is renewed when necessary by passage through a series of guinea pigs.

The well-grown cultures show a heavy mass of organisms, which generally sink to the bottom of the flask. This growth is of a whitish color splotched with brown. The cultures are then removed from the incubator and heated for one hour in the Arnold sterilizer. Then they are stored for two weeks in a dark closet to settle. The clear liquid is then carefully decanted and the growth proper is discarded.

A measured amount of the decanted liquid is concentrated over a steam bath to one-third its volume. It is then filled into flasks and sterilized and again filtered while hot, first through one then through three paper filters. Next the clear liquid is passed through a Berkefeld filter. This is followed by a concentration to one-tenth its original volume and sterilization.

To the raw mallein, concentrated to one-tenth its original volume, is added 0.5 per cent. carbolic acid and 20 per cent. glycerine. Then the liquid is again concentrated to one-tenth its original volume, filtered while hot through filter paper, and sterilized. It is kept in a dark place for a week, and, if upon inspection a precipitate is found, the mallein is again passed through paper filters and sterilized. The finished product is a clear, sirupy, dark-brown liquid, with a disagreeable odor. The mallein is then bottled, under aseptic conditions, in small vials and is ready for use.

It is advisable to provide the mallein for the tests in small vials, each containing about 1.5 cc. of mallein, which is sufficient for testing 15 horses. After the vial has been opened and part of the contents used for testing, especially if the mallein has been taken out with a camel's-hair brush, the remainder should not be used for tests applied on subsequent days, but should be discarded.

METHOD OF APPLYING THE TEST.

Before the application of the ophthalmic test the animals should be carefully examined to ascertain whether the eye shows conjunctivitis or other changes which are associated with suppuration. Should such be present the test should not be applied.

The test consists in introducing into the conjunctival sac of the eye several drops of either undiluted raw mallein or a solution of precipitated mallein (0.1 to 0.2 cc. per horse). This may be introduced either with the aid of a camel's-hair brush or with an eye-dropper. Only one eye is treated; the other serves as a control for comparison of the reaction.

The results of the test should be recorded as follows:

N = Negative.—Eye unchanged.

S = Suspicious.—Seromucous discharge.

P+ = Positive.—Seromucous discharge with purulent flakes.

P++ = Positive.—Distinct purulent discharge.

P+++ = Positive.—Purulent discharge with swelling of the eyelids.

P++++ = Positive.—Strong purulent discharge with swelling and gluing together of both lids.

The application of the ophthalmic test should not be repeated more than three times on the same animal within three months, as experiments show that the reaction after the third application within this short period usually loses its intensity in positive cases, and on subsequent tests may be entirely absent. In cases where the results of the second test immediately following the first test are atypical, the blood of such animal may be drawn and forwarded to a laboratory for the serum diagnosis. From experience gained with the eye test such a procedure would become necessary only in a comparatively few cases. In the control of glanders, animals may be retested every six months with satisfactory results.

CONCLUSIONS.

In the present state of knowledge of the subject, the Committee concludes:

1. That the ophthalmic mallein test is the most reliable and practicable for ordinary use. It is more accurate than the subcutaneous mallein test, and should be adopted for general use in lieu of the latter.

2. That the combined complement-fixation and agglutination test is the most accurate diagnostic method available, but can be carried out only in a laboratory properly equipped for the purpose. It should be used in cases where results of the ophthalmic test are doubtful or obscure and the final decision should rest on its outcome.

J. R. MOHLER, *Chairman.*
W. L. BEEBE,
V. A. MOORE,
L. VAN ES,
B. L. ARMS.

Book Reviews.

Graphic Methods for Presenting Facts. *By Willard C. Brinton. New York, 1914. The Engineering Magazine Co. Price $4. Cloth,—380 pages, 7 x 10 inches. 257 charts and other illustrations.*

Those who are interested in public health know that important and essential as is the study of conditions by experts, a campaign for a cleaner city or a lower death-rate will fail unless the results of this expert study are extended down to the crowd, and the public itself understands the facts and coöperates in effecting the remedy. After the data have been collected there arises a question, which expressed in a popular phrase is: "What are you going to do with them?"

The answer is found in an attractive and useful book of recent date. "Use graphic methods," says the author, or to quote him at length, "If it were generally realized how much depends upon the method of presenting facts, as compared with facts themselves, there would be an increase in the use of the graphic method of presentation. Unlimited number of reports, magazines, and newspapers are giving us reams of quantitative facts. If the facts were put in graphic form, not only would there be a great saving in the time of the reader but there would be infinite gain to society, because more facts could be absorbed and with less danger of misinterpretation."

The reader will find in this book a splendid collection of the best forms of charts and diagrams and other kinds of graphic presentation, covering a wider range of subjects. What makes the collection especially valuable is that it is composed of reproductions of actual charts, just as if the reader had gone to innumerable exhibits or had searched through many illustrated reports and found the examples best suited for the presentation of his own data. The book, therefore, is of interest to educators, social workers, engineers, statisticians, health officers and others. The comparative scarcity of charts dealing with health, vital statistics and kindred subjects emphasizes the need of graphic methods in these fields.

The book contains not only examples of current forms of charts and diagrams but also practical suggestions for the handling of materials, such as, for example, the kind of pins to use in making pin maps. The author has rendered a service both to the beginner by his careful collection and classification of the data, as well as to the professional by his constructive criticism of graphic methods already found in use. The *Survey* describes this book as "the only book of the kind ever printed."

Arthur R. Burnet.

Legal Principles of Public Health Administration. *By Henry Bixby Hemenway, A. M., M.D., formerly Vice-President, Michigan Medical Society, and American Academy of Medicine; formerly Acting Professor of Preventive Medicine, Chicago College of Physicians and Surgeons. 859 pages including index. Law buckram $7.50 net. T. H. Flood & Co., Publishers, Chicago, 1914.*

Hemenway on Public Health, at once a law book and a treatise on preventive medicine, is a book which goes farther than any work that has yet appeared toward filling a want long felt by a large and increasing number of professional men. The growing interest in public health work and the extensive development it has undergone in the last few years have raised a host of legal problems many of which are exceedingly intricate. City and district attorneys and other officials charged with the enforcement of various provisions of law relating to public health cannot fail to find this book helpful.

The text is written in an extremely lucid and readable style and the footnotes constitute a valuable collection of authorities. A legal treatise must of course cite cases as authority for the propositions of law stated by the author in his text; it is a pleasant surprise to find a doctor who has so well mastered this difficult technicality of law-book making.

The first chapter discusses in general terms the nature of public health work and refers briefly to some of the discoveries in medical science which have made it possible to conduct public health campaigns that are something more than guesswork. Among the section headings of this chapter we find such words as "epidemiology, protozoa, phagocytosis, host and carrier." The subjects thus suggested are of course treated in extremely brief encyclopedic style. Next in order are several chapters treating of the nature and functions of the various branches of government and their relation to public health. Doctor Hemenway gives considerable space to the principles of constitutional government and points out the relative authority of various kinds of law—constitutions, statutes and doctrines of the common law. Several chapters are given to the topics most frequently applicable to legal problems involving public health, such as "Police Power," "Due Process of Law," "Nuisances," and the maxim "*Sic utere tuo, ut alienum non lædas.*" Next comes a very long chapter on the law of public officers, their powers, duties and liabilities and their appointment and compensation. The last part of the book, which deals with the principles and authorities applicable to special cases, is distinctly the best.

The discussion of constitutional principles is naturally very elementary from the viewpoint of the lawyer. On the other hand, those portions of the text which fall more properly within the field of medical literature will seem to the physician or biologist to be simple statements of the rudiments of the subjects which they treat.

The index, rather meager for a legal text, is very well supplemented by the table of contents, which is complete. In it are shown all the section headings which for the most part furnish an adequate clue to the content of the section. Following the foreword is a collection of the legal authorities cited. This, together with the table of cases immediately preceding the index, will commend itself to lawyers using the book.

Although Doctor Hemenway's book is not a great law book, it is the best thing in its own field and it is well suited to the purpose of educating public health administrators, as well as members of both the legal and medical professions in regard to the points of contact between public health as a purely scientific thing and the other considerations involved in its administration. It is worthy of the indorsement given it by no less distinguished a member of the legal profession than Dean John Henry Wigmore of the Law School of Northwestern University in the foreword which bears his name.

L. W. Feezer.

The Principles of Hygiene. *A Practical Manual for Students, Physicians, and Health-Officers. By D. H. Bergey, A. M., M. D., First Assistant, Laboratoy of Hygiene, and Assistant Professor of Bacteriology, University of Pennsylvania. Illustrated. Fifth Edition. Thoroughly Revised. 4°. 531 pages. W. B. Saunders Company, Philadelphia, 1914.*

The reviewer notes that this work has passed through five editions and in addition several reprintings since it was first published in 1901. Its aim is to meet the needs of students of medicine in the acquirement of a knowledge of those principles on which modern hygienic practices are based; to aid students in architecture in comprehending the sanitary requirements in ventilation, in heating, in water supply, and in sewage disposal; and to aid physicians and health officers in familiarizing themselves with the advances made in hygienic practices in recent years. This, of course, represents a large undertaking, and, in justice to the author, it is fair to say that the work has been fairly well accomplished. Throughout the book, however, there are evidences that the work has not been kept up to date. This is especially true of the statistics which, in most instances, relate to a period more than twenty years ago. The result of this is seen, for example, in tables such as are shown on page 21 and on page 23, where the reader receives the impression that death-rates in this country range between 17 and 18.

In discussing bacteria in expired air, the writer gives the impression that only in those ill with diseases of the respiratory tract is there danger of the dissemination of the specific disease-producing bacteria. This, of course, entirely overlooks the fact that normal carriers are very common in just this class of microorganisms.

The diagrams illustrating the distribution of air by various systems of ventilation are the familiar ones which experience has shown indicate the hopes of the ventilation engineer rather than the result actually obtained.

On page 113, the author describes the water supply of New York City and mentions that the amount of water available in the Croton watershed is barely sufficient for present purposes, and that preparation must be made for an extension without delay. No mention is made of the fact that the development of the Catskill watershed at an expense of $160,000,000 is almost completed and that the supply will be available within a year or so.

In chapter V, a number of types of water closets are shown and the statement is made that the hopper closet is one of the principal types now in use. Although the chemical treatment of sewage is discussed, there is no mention of the chemical disinfection of sewage effluence.

The potential energy of food is described and a calorie is defined. The definition, however, refers to the small calorie and it is the small calorie which is used in most of the tables which follow. At the same time, without any explanation of the difference between small and large calories, a table is given on pages 186, 187 and 188, in which the large calorie is used.

On page 209, it is stated that New York City proposes to require tuberculin tests of all cows whose milk is sent to the city. This, of course, is an error. The requirement relates only to certified milk. No mention is made of septic sore throat as one of the diseases spread by milk.

On page 212, the new milk law of Philadelphia is described and the recommendation is noted that the milk should reach the city at a temperature not exceeding 50 degrees Fahrenheit. "This regulation, if enforced, will prevent the enormous multiplication of bacteria in milk in transportation to the city." It would have been more instructive to have cited the experience of cities like New York, which have enforced such a regulation for the last ten years with great success.

On page 284, although vitamines are discussed, the term "vitamines" is not mentioned. The reviewer fails to find lead poisoning, phosphorus poisoning, caisson disease, anthrax and glanders among the list of industrial diseases.

The statistics concerning school medical inspection, given on page 288, are fifteen years old. It is not unreasonable to believe that they are not representative of present conditions.

No mention is made of incinerators in connection with the disposal of excreta in armies.

The author states that the curative value of antimeningitis serum is still under investigation. He makes no mention of its intraspinal use.

Statistics concerning the value of small pox vaccination, as given in a table on page 370, relate to Austria-Hungary, Italy and France from 1883 to 1896.

Calmette's tuberculin reaction for the eye is incorrectly described as performed with a 1 per cent. solution of tuberculin. As a matter of fact, it is a solution of an alcoholic precipitate of tuberculin.

The Wassermann reaction is dismissed with ten lines and nothing is stated regarding its very great value. On the other hand, seven lines are devoted to the precipitation reaction of Michælis, although this has everywhere been abandoned.

The quarantine laws of the United States are given apparently in full and occupy more than fifty pages. The first of these is dated 1902 and includes the act which changes the name of the United States Marine Hospital Service to the Public Health and Marine Hospital Service of the United States. The reviewer is strongly of the impression that this act has been superseded and that the title of the service now is the United States Health Service.

The reviewer has noted the defects in some detail not with a view of adversely criticising the book but rather to enable the author, in a subsequent edition, to enhance the value of the work. It is difficult to compress the vast fund of information in this field into five hundred pages and taking it, all in all, the present work gives a satisfactory survey of this important field.

C. F. Bolduan.

The Tuberculosis Nurse, Her Functions and Her Qualifications. *By Ellen N. LaMotte, R. N., Graduate of Johns Hopkins Hospital, former Nurse-in-Chief of the Tuberculosis Division of the Baltimore Health Department. 292 pages. $1.50. J. P. Putnams' Sons, New York and London.*

Eight years' experience in tuberculosis work in Baltimore, first as a field nurse of the Visiting Nurses' Association, later as organizer and director of the Tuberculosis Division of the Baltimore Health Department, have convinced Miss Ellen LaMotte that the crux of the tuberculosis problem lies in the segregation of the advanced case and that the function of the tuberculosis nurse is to teach patients and their families the necessity for such segregation. "Her one great duty—the paramount reason for her existence—is to induce the infectious patient to go from his home into an institution." Physicians tell us that the careful consumptive is not a menace. Miss LaMotte says that a careful *enough* consumptive doesn't exist and quotes figures to prove that even after prolonged home supervision by nurses practically only one half of the patients supervised can be considered as even *fairly* careful.

As segregation on any wholesale plan is still far from practicable, the nurse's first care is the family; her second, the patient himself; but it is by working through the latter that the former may be reached.

The standard set for the nurse's qualifications, both personal and technical, is high. Tuberculosis associations generally will do well to follow the advice given regarding the selection of workers. Questions of the nurse's salary, of the daily routine of work, of the necessity for safeguarding her own health, the relation between nurse and general practitioner, coöperation with organized social and relief agencies are discussed with a frank recognition of inherent difficulties such as could only result from a first-hand knowledge of the problems the tuberculosis nurse is constantly facing.

Some physicians will resent the author's strictures on certain members of their profession. Many nurses will disagree with her dictum regarding relief-giving. Social workers will rejoice at this testimony from a medical worker.

The technique of tuberculin tests is described and the methods of fumigation which obtain in Baltimore are noted at length. The value of these procedures as well as the mooted question of sanatorium care is being widely discussed by experts in various cities throughout the country. The final decision must rest with the medical profession.

One could wish that the few figures quoted had been more carefully related; that the social value of records and reports had been dwelt on at greater length; that more emphasis had been placed on constructive work with the non-infectious child to prevent his developing a few years later into the infectious adult.

Not the least interesting feature of the book is an illuminating introduction by Dr. Louis Hamman, Physician-in-Charge of the Phipps Tuberculosis Dispensary, Johns Hopkins Hospital, in the course of which he pays tribute to Miss LaMotte's honesty and enthusiasm. In closing, he says: "The book will be interesting and helpful and, what is more important, stimulating to all engaged in tuberculosis work. All the better if some parts of it cause surprise and opposition—we will then review more critically our own attitude."

F. Elisabeth Crowell.

Health Department Reports and Notes.

REPORTS.

Dover, New Hampshire.

The executive officer of the board of health of Dover submits his annual report for the year 1915. Dover is a city of about 13,000 population, situated on a tidal estuary near New Hampshire's coast.

During the year the board expended eight thousand dollars or about sixty-two cents per capita population. On first sight this is a creditable showing but investigation reveals the fact that by far the greater part of this went for garbage disposal, street cleaning, and so forth. These activities manifestly need money and attention but Dover should not deceive itself with the idea that the $6,793.73 which it spends for garbage collection and disposal, street cleaning and sewer work is spent for the public health merely because the board of health is in charge of the expenditure. The effect of this work upon health is only indirect and if it were done by a different board, as it should be, the people would realize that they are spending less than ten cents per capita on health work and are getting very little for their money.

The executive officer receives only $900 per year and if we disregard garbage, sewers and street cleaning we find that he reports little more than the following:

1. Milk. Inspections (number not stated) have been made of barns, utensils and vehicles and "such recommendations made as seemed necessary." The state board of health has now passed rules which are said to remove from the local board of health the responsibility for enforcing regulations for the protection of the milk supply.

2. Water. "The reports of the state chemist clearly show that the water supply is of excellent quality."

3. Inspections. The report indicates that sanitary inspection has been regularly carried on and a list of inspections is given. The yards and streets are clean and privies are being abated.

4. Contagious diseases. The table of cases during the year certainly makes a favorable showing, but the fact that in a city of 13,000 only two cases of whooping cough and three cases of measles are reported in a year indicates that the reports are incomplete.

5. Schools. The basements were inspected monthly. Various rooms have been fumigated during the year as a precautionary measure. Children were occasionally sent home by the city physician on account of contagious disease.

6. Vital statistics. An archaic alphabetical list of causes of death (including old age, senility, gangrene, blood poison, marasmus and other undesirable terms shows the total deaths. The death-rate, corrected for non-residents, was 19 per thousand.

The report gives no intimation of any actual work done by the board of health on medical inspection of schools, investigation and suppression of infant mortality, bacteriological control of the milk supply or any of the other lines of work considered as a part of the duties of an up-to-date health department. The health officer calls attention to the fact that very little ($540.24) aside from his salary is being spent on matters pertaining strictly to the public health.

To judge from the report we might conclude that as a matter of fact its health work is being done by the garbage department, a plan which is now out-of-date.

Fort William, Ontario.

Fort William, a city of 27,000, on the shore of Lake Superior appears to be another one of the Canadian cities which is falling into line in the forward movement for progressive health work. The expenditure for health work, including the isolation hospital, is only thirty-four cents per capita. Improvements are being made and it is possible that as the people realize the facts they will coöperate more generally.

The chief advance in 1914 was the appointment of a whole-time health officer to direct the work. He has inaugurated a department of vital statistics and is thus able to direct his efforts more surely to the lines of activity which need attention. He has succeeded in greatly reducing the number of deaths from diarrheal diseases in infants by means of visiting nurses who have followed up the reports of births and given instruction to the mothers. The employment of an assistant in the division of sanitary inspection has enabled the chief sanitary inspector to devote his entire time to food and dairy inspection. Regular inspection of dairies and instruction of the farmers is causing an improvement in the milk supply.

The medical inspection of schools is now in the hands of a nurse who spends full-time instead of half-time as in the past. A dental society has been formed in the city and has made a proposition for the dental inspection of school children which the health officer hopes may be put into practice.

The report of vital statistics shows a death-rate of 11.2; a birth-rate of 35 and an infant mortality rate of 116.8. These figures would have added interest if those for the years preceding were also cited. The report is published in a good business-like form and is a credit to the city.

Framingham, Massachusetts.

The annual report of the town of Framingham for 1914 devotes about twenty pages to the report of Mr. R. N. Hoyt, agent and milk inspector of the board of health. Framingham has a population of 14,000 and is one of the towns which coöperate to secure efficient supervision of health work by the Coöperative Boards of Health. This coöperative system was originated and sponsored by the Sanitary Research Laboratory of the Massachusetts Institute of Technology and has previously been described in this magazine. Briefly, its purpose is to enable small cities and towns to secure first-class health organization under the supervision of experts of a grade which they could not afford to employ except by coöperation with each other. The plan has met with such success that the surrounding towns have seen its advantages and ten of them now pay their share toward its support.

The report follows in a general way the standard form recommended by the Massachusetts Association of Boards of Health. It gives not only the definite statistics and facts in regard to the prevalence of disease, the work carried on, and the improvements made; but is also planned to have a distinct educational value. This is accomplished by emphasizing the causes of disease and the methods of prevention; the work of the health authorities; the responsibility of the individual; and the possibilities of still further improvement.

Although the two years in which the coöperative boards have served Framingham is too short a period on which to base conclusions, it may be noted that there has been a very marked decrease in the infant mortality rate, "the barometer of sanitation." The general death-rate has been lowered, the quality of milk sold and the condition of dairies shows marked improvement; and the typhoid and diphtheria situation shows improvement. Scarlet fever and measles show an increase, possibly due to more complete reports of cases of these diseases which are often neglected and partially due to the fact that the cases have in general been so light as to go unrecognized until they had passed the infectious stage.

The report includes special reports on the laboratory, infant mortality, food inspection, control of nuisances, housing, and fly and mosquito extermination.

North Adams, Massachusetts.

The board of health of North Adams presents an excellent report for the year ending November 30, 1914. Not only is the report prepossessing in appearance, but also it indicates a spirit of progress, and comparison with the reports of previous years shows that improvements in methods are continually being introduced.

The city has a population of about 23,000 and spends thirty-eight cents per capita through the health department, but eleven cents per capita out of this sum goes for garbage collection. The death-rate is under 14 per 1,000.

Contagious diseases have been well-controlled in general but the board complains of the difficulty in suppressing epidemics when parents and physicians carelessly or willfully fail to report the cases. This criminal neglect is naturally reflected in the health of the community. The only serious outbreak, however, was of typhoid fever. Fifty-one cases occurred during August and September and all were traced to a milk peddler who continued his rounds for two weeks while suffering from typhoid. The difficulty of tracing the epidemic to its source was increased by the fact that much of the milk was sold to various dealers in summer drinks. The fact that the city water supply ran low at the same time gave rise to a popular belief that the typhoid was water-borne but there was no foundation for the rumor.

Milk and dairy inspections have been increased and a list of dealers with the score of their dairy is published. The board recommends the passage of an ordinance requiring that milk be sold in bottles only.

Medical inspection of schools is carried on by physicians and is aided by the teachers. The school nurse, formerly employed, has resigned, and apparently her place has not been filled.

The tables of vital statistics should be more complete and might be better arranged. The system of classification of causes of death is better than the common home-made type but should be replaced by the international system.

Infant mortality is not discussed and apparently receives no attention.

North Yakima, Washington.

It is to be regretted that a health department which was in a position to serve as an example to other departments all over the country and which has done so to some extent should be unable to publish a more complete report. Each year the report of the health department appears as a dozen pages in the city report and consists only of a series of "exhibits" which are largely of a tabular nature. We may also note with regret that North Yakima has decided to make a marked reduction in its health expenditures. Considering what the city gained by the investment of money in sanitation, it appears to be a rather short-sighted policy which drops the investment when good results have been obtained and assumes that the good conditions will continue. It is to be hoped that they will continue and as matters stand at present they are likely to, although no great improvements can be expected.

To show how well the health of the city has been maintained despite the cut in appropriation we need only to cite the death-rate for residents of 5.33 and the infant mortality rate of 80 per thousand births.

The exhibits include reports of vital statistics, of milk inspection, food inspection, meat inspection, sanitary inspection and of the bacteriological laboratory and the city nurse. The tables are neatly arranged.

NOTES.

School Medical Inspection in New York City.—Clinton P. McCord, M. D., in the April *Albany Medical Annals,* discusses at some length the machinery for carrying on this work and the routine method for examining the eyes, ears, tonsils, nose, teeth, nutrition and skin. He also considers the work of the health officer in dealing with contagious diseases, physical defects of school children, and physical training.

The purposes of school medical inspection he summarizes as follows:

1. To detect and exclude cases of parasitic and contagious disease, and to prevent epidemics of the same among public school children.

2. To detect physical defects and secure correction of these defects through the coöperation of school officials, school nurse, parent, and family physician or dispensary chief.

3. To pass judgment on the physical fitness of teachers and janitors.

4. To act as expert to the Board of Education

in maintaining sanitary conditions and proper physical equipment in the schools.

5. To teach practical hygiene in school and home through the agency of the school nurse.

6. To diagnose mental deficiency.

7. To make special studies of the relation of the physical child to the various phases of educational activity, and in conjunction with the superintendent of schools to correlate preventive medicine and pedagogy in order to produce a maximum of efficiency in the schools consistent with the preservation of health.

8. To coöperate with all agencies concerned in the social, moral, mental and physical improvement of the child.

For the efficiency of the medical inspector he recommends (1) the reading of a few good books such as "Health and Medical Inspection of School Children," by Dr. Cornell (F. A. Davis and Company); "Medical Inspection of Schools," by Doctors Gulick and Ayers (Survey Associates); "The Hygiene of School Life," by Dr. Ralph Crowley (Methuen and Company, London); "School Health Administration," by Dr. L. W. Rapeer; "The Hygiene of the School Child," by Terman; "Civics and Health," by William H. Allen (Ginn and Company); and "Health in Education," by McKenzie; (2) study of the work done in other cities and the perusal of recent literature, and (3) coöperation.

⁂

"Disinfection of Subway and Elevated Cars.—In the *Bulletin* of the New York City Health Department, a letter is printed from the general manager of the Interborough Rapid Transit Company, announcing that the company has decided to discontinue the use of disinfectants in its cars, relying rather upon frequent airing and thorough mechanical cleansing of the floors and all points of contact."—*The Trained Nurse*, April, 1915.

⁂

The Health of City Children Compared with that of Country Children.—In the annual report of the medical officer of Hertfordshire, England, for 1913, there is a comparative study of the health conditions of these two classes of children based upon the examination of over eighteen thousand children, care being taken to compare only those of like nationality and social condition.

The comparison shows that the rural children are larger, possess fewer defects of clothing and foot-gear, of nutrition and cleanliness of the body, of vision, hearing and speech, of mental condition and of vaccination. The urban children show fewer defects in respect to regularity of attendance, clean heads, teeth, tonsils, adenoids, and cervical glands, ear diseases, heart and circulation, infectious and contagious diseases. The superiority on all these cases is quite marked. The urban children probably owe their superiority in certain matters to the resources of the towns, and the villages may be expected to improve in these directions in the future. The reputation of the countryside for health seems to be maintained.—*Public Health*, April, 1915.

⁂

New York's Child Welfare Campaign, 1914.—The work of the division of child hygiene of the New York State Department of Health was recently outlined by the director of the department, H. L. K. Shaw, M. D., in the *New York State Journal of Medicine.*

The Department was established in January, 1914. While the infant death-rate in New York City during the ten years preceding this date had been reduced from 162 to 96 per 1,000 living births, that outside New York City had fallen but little. Infant welfare work in the state had been carried on in only 12 localities. A campaign of education by means of popular exhibits, talks and demonstrations was planned and the following program carried out. Forty-five cities were visited and 150 popular health lectures were given, 57 fairs were visited. Later the exhibits were sent to various smaller villages. Seventy-five thousand leaflets and pamphlets were distributed, these being published in Polish and Italian as well as in English. Special instruction was given to mothers in regard to the clothing and diet of babies.

The total expense of the campaign was $14,500. The infant mortality for the state was reduced from 126 to 111, corresponding to a saving of 1,400 infants' lives. In 32 of the 45 visited the infant mortality fell below that of 1913, while of the 12 cities not reached, only four reduced the death-rate.

The fact that there has been a slight increase in the total number of deaths in the state during the year is evidence that the reduction of infant mortality has been due to this campaign and justifies its continuation and elaboration during the next year.

*

School Epidemics.—The following "Health Hint No. 42" sent out by the Division of Publicity and Education of the New York State Department of Health is another good statement of the futility of attempting to stop epidemics by closing the schools.

"When an epidemic of diphtheria, or measles, or whooping cough broke out in a school, the old-time health officer saw only one thing to do—to close the school; but today there are better and much more effective ways.

"When a school is closed in the midst of an epidemic there are almost certain to be a number of the children who have become infected, but have not yet 'come down' with the disease. When the school is closed these children are sent back to their homes where they are under no supervision. They play freely with their friends and with their brothers and sisters. In a few days the disease germs have grown in their nose or throat, so that they have a little sore throat or a slight running at the nose. This is the *most dangerous* stage of the disease when the germs are being discharged in largest numbers and greatest activity. Yet the children feel fairly well. They are up and about playing with other children and freely *spreading the disease.* In particular they are likely to infect their little brothers and sisters who are specially in need of protection, since these diseases are much more serious for infants than for children of school age.

"The modern way of dealing with school epidemics does not involve the closing of the school at all but uses the school as a most valuable aid in *keeping the children under observation,* detecting the early cases of disease so that they may be isolated and kept from doing harm to anyone. Each school should have a school physician to carry out the necessary supervision. In the case of diphtheria, cultures can be taken from the throats of all the children, and all carriers of diphtheria germs at once discovered. In measles and whooping cough outbreaks, the children can be examined by such a school physician, and the ones who are coming down picked out much sooner than they would be recognized at home. Then these dangerous individuals can be so isolated at home that they cannot spread infection to anyone else in the school or out.

"Last fall Sanitary Supervisor Sears of Onondaga County was called to a town where there was an epidemic of diphtheria. In one school of 240 pupils there were 32 children whose throats contained diphtheria bacilli. The Supervisor persuaded the School Board and the local Board of Health to keep the schools open and to obtain a good visiting nurse to inspect all the children daily and to see that those excluded from school were properly isolated. He had to overcome some opposition to the plan but it was finally followed out and, in a very short time, the outbreak was checked."

*

Reaching the People.—"The county health commissioner of Union County, Indiana," according to *The Journal of the American Medical Association,* "feels that one of his duties is to teach the people of the county how to keep well. He has accordingly prepared a little seventy-five page pamphlet, made up largely of material published by the various state boards of health. The board of county commissioners made an appropriation to send a complimentary copy to every home in the county. The pamphlet is simply but forcibly written, and contains chapters on the home, contagious diseases and the baby. In the first chapter, the people are told how to keep their homes clean and healthful, how to dispose of their garbage, how to care for their food and how to take care of their bodies. Directions for disinfection and especially directions for various contagious diseases make up the second chapter, while the third and most important contains directions to mothers for the care of themselves and their children. We have been a long time in learning that if the teacher of good health would compete with the patent medicine man, he must meet him on his own ground. Instruction of the people on health topics is a public duty. It should not be left to professional zeal or to philanthropy. The publication and distribution of such pamphlets as the Union County Health Book are directly and solely for the public good and will yield large dividends in the form of better health and prosperity for the people.

If each county in the nation had a health officer as wide awake and a board of commissioners as broadminded as those of Union County, Indiana, the problems of the prevention of disease and the prolongation of life would be immensely simplified."

* * *

On Competitive Basis.—In an effort to secure better and more interested coöperation between local health officers and the Kansas State Department of Health—a letter—from which the following excerpts are quoted was sent last month by the latter organization to every local health officer in Kansas.

State of Kansas,
State Board of Health,
Topeka, April 2, 1915.

To Health Officers:

Morbidity reports are to be mailed each Saturday night. If no reports are received from physicians during week, you are expected to mail us a "No report" card instead. If by the following Wednesday we do not receive either the reports or a "No report" card, you are marked "Delinquent." We are keeping careful check of delinquencies for this year, and we hope to encourage regularity of reports by apprising health officers of their records at the end of each quarter.

For the past quarter—that is, weeks from January 2 to March 27, inclusive—we should have had 12 weekly reports from you. For each week you missed we deducted 8$\frac{1}{3}$ per cent. from your score. This list will show you where you stand:

COUNTIES.

	%
Bourbon, Brown, Butler, Clark, Clay, Cloud, Graham, Harper, Haskell, Kiowa, Leavenworth, Lincoln, Marion, Miami, Mitchell, Montgomery, Nemaha, Ness, Osage, Ottawa, Riley, Sedgwick, Sherman, Smith, Sumner, Woodson	100
Allen, Barton, Chase, Cherokee, Cheyenne, Comanche, Cowley, Doniphan, Douglas, Elk, Ford, Geary, Gove, Hamilton, Jefferson, Kingman, Lane, Lyon, Neosho, Norton, Rawlins, Wallace, Wilson	91$\frac{2}{3}$

CITIES.

Parsons, Coffeyville, Hutchinson, Wichita, Topeka	100
Leavenworth	91$\frac{2}{3}$
Fort Scott	83$\frac{1}{3}$
Kansas City	75
Pittsburgh	50
Atchison	8$\frac{1}{3}$

Fraternally yours,
John J. Sippy, M. D.,
Epidemiologist.

* * *

Who? Me?

Flies Carry Unnamable Filth to Food.
I Counted.....Flies in Your Place of Business.
Date........ A Customer.

The Kansas State Board of Health furnishes free cards bearing the above blank and encourages customers throughout the state who object to buying food over which flies have crawled to spend idle waiting moments in the shops of their butchers, bakers and grocers in counting flies. The above protest can be later filled out and mailed. If these arrive in sufficient numbers and from various sources, the Kansas Board thinks they may have desirable effect.

* * *

A Good Record.—The *Health Department Bulletin* of Asheville, N. C., for March, reports an enviable record for 1914 in the fight against typhoid.

It says:

"The Health Department is proud of the fact that there was not a single death from typhoid fever in Asheville in 1914 due to local causes—and only one resident death, caused by nursing an imported case.

"The fight against typhoid fever is not for the special benefit of the infant, nor the adult, nor the middle-aged, nor the old—but for them all collectively—so collectively let us set about this year to keep up our high standard, and challenge the world for a better record—

How?

"Vaccinate against typhoid fever—it is harmless—it protects. Drink Asheville water only.

"See that your dairyman's bacterial count is low—if not, buy from one that has clean milk.

"Swat the fly now and all the time.

"Wash your vegetables."

Defends Non-fumigation Attitude.—Incited by the criticism of a New York newspaper, the New York City *Health Bulletin* for April 10 stoutly defends the abolition of fumigation which it has adopted. After a short review of a charge of inadequate preventive measures with respect to measles, it says:

"The continuation of fumigation in Brooklyn (a borough in which fumigation is being continued as a control) was criticized by some of our friends, who inferred that the Department was wobbly in its attitude. As a matter of fact, the Department was not in the least wobbly. By continuing to fumigate in Brooklyn, we are obtaining just the kind of evidence needed to answer such superficial and uninformed criticism as that of the press.

"For the information of those interested, the following facts are presented, not as conclusive, because the period of the demonstration or 'experiment' is yet too brief for that, but as suggestive and as disposing, for the time being at least, of the argument made by the New York press:

"During the month of March, 1914, 1,606 cases of measles, with 53 deaths, were reported in the Borough of Manhattan.

"During the month of March, 1915, in the absence of fumigation, 1,357 cases of measles, with 15 deaths, were reported.

"In the Borough of Brooklyn, where fumigation continues to be performed, 1,652 cases of measles were reported during March, 1915, as against 1,413 in March, 1914.

"In the city as a whole, which includes both fumigated and non-fumigated districts, the number of cases of measles from January 1st to date exceeds the corresponding figures for 1914, is about the same as the figures for 1913, and is much less than the total for the corresponding period of 1912."

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Restaurant Inspection.—An excellent article on bakery and restaurant inspection appears in the *Bulletin of the Seattle* (Washington) *School of Sanitary Science*, the official organ of the health department, for February. Seattle has 916 restaurants, lunch counters, bakeries, candy-kitchens and confectioneries to be inspected and each of these is visited, on the average, once in every forty-two days.

It is pointed out that due to cramped quarters so frequently found, a certain confusion and apparent carelessness is sure to prevail in restaurants during rush hours. Newspaper reporters are most liable to visit these places at just such times and the article warns them against being unjust. Inspectors are instructed to make due allowance for such conditions.

The great importance of location is emphasized and the desirability of first-or second-story rooms as contrasted with basement quarters, is pointed out. Basement shops are scored lower than those above ground of equal cleanliness and new places are not permitted to be established in quarters of which the health department disapproves.

The score card used has for its purpose the facilitation of systematic supervision and its provisions are so reasonable that 44 out of 76 restaurants and bakeries taken at random score 90 or more.

Every restaurant is required to operate under a permit issued by the health department, and "every employee, in any place where candy is handled, or in any bakery or place where food is handled or sold, must pass a rigid physical examination and receive a health certificate before he or she is permitted to work in any such capacity." These certificates must be renewed annually and must be kept on file for inspection.

*

Sanitary Campaign Plan.—A plan for a "year-round sanitary campaign" suitable for towns and cities of 1,000 to 10,000 population, has recently been outlined by the Dallas (Texas) Chamber of Commerce. The plan aims at both the business and residential districts, makes use of score cards and newspaper publicity and provides for "Civic League" committee inspection.

A "cleanest block" competitive plan attempts to secure residential district reform. The plan is reported to be very successful in Dallas.

Personal Notes.

Dr. G. M. Cooper, whole-time health officer of Sampson county, North Carolina, will soon be a member of the official staff of the State Board of Health. He begins work May 1 as chief of the Bureau of Rural Sanitation and as assistant secretary. The Bureau of Rural Sanitation replaces the Rockefeller Sanitary Commission's division of work which was discontinued in March.

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Noteworthy among Yale corporation appointments is that of Professor Charles-Edward Amory Winslow to be professor of public health in the Medical School, on the Anna M. R. Lauder Foundation. Professor Winslow was born in Boston in 1877 and received the degree of Bachelor of Science from the Massachusetts Institute of Technology in 1898 and the degree of Master of Science in 1899. After acting as assistant health officer in Montclair, N. J., and working for the Massachusetts board of health, he became instructor in sanitary biology and later assistant professor in the Massachusetts Institute of Technology where he remained from 1901 to 1910. During the later years of his connection with the Institute he was in charge of the sanitary research laboratory and of the sewage experiment station. He then became associate professor of biology in the College of the City of New York and is at present head of the division of publicity and education of the New York State department of public health.

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The following were elected to membership in the American Public Health Association on April 19, 1915:

Henry Nollner Rosser, M. D., Birmingham, Ala. Jefferson County, Alabama.

Wm. Eustis Brown, York Village, Maine. Health Officer.

John Richard Taylor, M. D., Madison, Wis.

Waldo Moffett Bowman, Toledo, Ohio. Pharmacist. President Ohio State Pharmaceutical Association.

Carrol Fox, M. D., U. S. Public Health Service, Washington, D. C. Surgeon, U. S. Public Health Service Pure Food Department, Dallas Chamber of Commerce, Dallas, Texas.

Wm. Everett Musgrave, M. D., Manila, P. I. Physician, Dean, College of Medicine and Surgery, University of Philippine Islands.

Ray Lyman Wilbur, M. D., San Francisco, Cal. Dean of Stanford University Medical School.

Julian Mason Gillespie, M. D., U. S. Public Health Service, New Orleans, La.

Owen R. Lovejoy, New York. General Secretary, National Child Labor Committee.

Walter Emerson Brown, Beverly, Mass. Sanitary Bacteriologist U. S. Public Health Service.

Chester A. Darling, Ph. D. Allegheny College, Meadville, Pa. Professor of Biology, Allegheny College.

Ellis Kellert, M. D. Bender Hygienic Laboratory, Albany, N. Y.

Aaron Gretzner Levy, New Orleans, La. Civil Engineer; Assistant Director of Purification, New Orleans Purification Plants.

Newton E. Wayson, M. D., San Francisco, Cal. Assistant Surgeon U. S. Public Health Service.

Robert Brooks Morse, Baltimore, Md. Chief Engineer, Maryland State Department of Health.

Charles Vernon Patchin, M. D., Dansville, N. Y. Sanitary Supervisor, New York State Department of Health.

Clifford Penney Fitch, Ithaca, N. Y. Bacteriology Teacher, New York State Veterinary College, Cornell University.

Wm. Sylvanus Shilds, Chicago, Ill. Consulting Engineer.

E. Alexander Hand, M. D., Walton, N. Y. Health Officer.

Arthur Sautter, M. D., Albany, N. Y. Health Officer of Albany.

Jason Franklin Chase, Boston, Mass.

Victor Hugo Stickney, M.D., Dickinson, N.D.

George Donohoe, M. D., Cherokee, Iowa. Superintendent Cherokee State Hospital.

Daniel Hartman Kress, M. D., Melrose, Mass.

Randolph H. Grimm, M. D., U. S. Public Health Service, Washington, D. C. Passed Assistant Surgeon U. S. Public Health Service.

Albert John Hoskins, M. D., Company E. Engineers, Fort Crockett, Galveston, Tex.

Harry Rutledge Hall, Baltimore, Md. Principal Assistant Engineer, Maryland State Department of Health.

Public Health Notes.

Discovers Typhus Organism.—The press has just announced the recognition of Dr. Harry Plotz, a bacteriologist of Mt. Sinai Hospital, New York City, as the discoverer of the organism which is the specific cause of typhus fever. The young discoverer also claims that he has perfected an anti-typhus vaccine. The above claims were demonstrated—apparently to the satisfaction of New York pathologists and physicians—at a meeting of the New York Pathological Society on April 14. Doctor Plotz—only 25 years of age, according to the press—is accredited with a discovery of the highest scientific character and value. It is reported that Dr. Hans Zinsser, the eminent New York bacteriologist who left last month for Serbia as a member of the Rockefeller expedition to take up the fight against typhus, was vaccinated with Doctor Plotz' new prophylactic before his departure. The immense value which all this work may have—in the event that the discovery proves true and the use of the vaccine is practicable—is realized from the following realistic description by Sir Thomas Lipton of the ravages of this highly infectious disease in Serbia:

"Disease is rife everywhere—typhus. Neither man, woman nor child of whatever station in life is immune from it. I went to one hospital where there were twelve American nurses, nine of whom had the disease. The American doctor who met me at the station at Ghevgheli and showed me round the place was dead when I called a few days afterwards."

⁂

Medical Inspection of Schools.—The following list of recent converts to the efficacy of medical school inspection is taken from *The American School Board Journal* for January, 1915. The details involved in the application of general principles to specific cases are interesting and would doubtless be even more illuminating if compared in greater detail.

"The school board of Kewanee, Ill., and the nurse's board of the local women's club have coöperated in adopting a plan for promoting the general health of the children and the physical tone of the schools.

"The plan seeks to prevent the spread of epidemics, to equip the pupils for their studies by removing physical defects, and to keep up the standard of health in the schools. It is provided that: Any child who appears to be in poor health, or who shows symptoms of disease, will be sent by the principal to a dispensary for examination. Physicians of the city will serve in rotation for the preliminary examinations.

"Dental clinics will be held twice each week. Children are encouraged to go to their family physicians or dentists if in need of immediate attention. Children of parents who cannot pay for medical treatment, may be referred to the county physician. All work at the dispensary is free of charge.

"Niles, O. Upon the suggestion of Supt. W. C. Campbell, the school board has approved the appointment of a school nurse to serve three days of each week. Her duties will be to instruct mothers in the care of children, and to detect signs of disease. Sanitary conditions in the schools and homes will be given particular attention.

"Pontiac, Mich. The school board has provided for the appointment of a school nurse to follow up cases reported by the medical inspector.

"Walla Walla, Wash. Since the opening of the school term, the medical inspector has been engaged in notifying parents of the results of the medical examinations of pupils. The remainder of the school year will be devoted to inspections of newcomers and primary children who are in school for the first time. It is planned to examine children once every two years so that children who were inspected last year will not be subjected to scrutiny until the beginning of the next school year.

"Berkeley, Cal. Medical inspection of the school children is in charge of municipal nurses who examine the children and report on their condition. The schools are divided among the staff so that each one keeps as nearly as possible the same schools and records the results. The children are examined for vision, hearing, throat or mouth trouble, breathing and general nutrition."

Progress in North Carolina.—According to the North Carolina State Board of Health, a law passed by the recent General Assembly empowers cities, towns and counties to provide for the treatment of their indigent tubercular sick at the State Sanatorium, the cost of the treatment to be not more than a dollar per day. This law makes possible the means whereby towns and counties may care for their tubercular sick and give them a chance at recovery under the best possible circumstances the state can afford.

"In some states, counties and towns maintain their own sanatoria, but for efficiency and economy, a sanatorium maintained by the state and coöperated with by the towns and counties has proved the better plan."

⁂

Better Ventilation for Schools.—The following directions for the installation of "cloth window ventilation" in schools—and the valid reasons for such a plan—may be timely. The well-known annual increase of the infectious diseases of childhood, when children come together for school in the autumn, and the great desirability of remedying this condition, may be in addition to the following another public health and even economic reason for better ventilation of schools.

"The cloth ventilating screen is a closely fitted wood frame covered with heavy finely woven unbleached cotton cloth (Block Rock for ordinary exposures and Pequot for exposed situations). These are placed in the window frames outside the lower sash, which is then raised. Each school room requires about one square foot of screen per pupil.

"The frame need not have mitred or tenoned joints but simply secured with two ten-penny wire nails at each corner to fasten the upright pieces to the top and bottom pieces. When the cloth is put on and fastened by the fillet in the groove the frame is perfectly rigid and strong as the stretched cloth holds it together.

"A nice quality of cypress makes a very substantial frame which can be stained with a solution of one part of asphaltum varnish in sixteen of turpentine.

"Built in this manner the cost will be from $1.00 to $1.50 per screen. Of course they can be made of oak or of any material and mortised together at greater cost.

"The cloth screen acts as a permeable membrane, allowing the outside air to slowly diffuse into the room; the closely woven cloth divides the incoming air into currents of infinitesimal size and of very slow velocity, so that it is quickly mixed with the warm air of the room with no perceptible drafts.

"The cloth screen also acts as a filter removing the dust from the atmosphere and as a result the screened rooms are practically free from dust unless dirt is brought into the rooms upon the children's feet. By its use as an air filter the cloth will sooner or later become very much discolored and filled with dirt, when it should be removed and new cloth put on; there is no use trying to wash out the dirt—it has become a part of the fibre of the cloth.

"The degree of air pollution of a room can be inferred very readily and correctly by the odors one perceives on coming in from the fresh outside air. It is a fact that the screened rooms are practically free from odors. Generally the odors from the clothing in the coat rooms add very much to the already bad air of schools, which can be remedied very effectually with cloth window screens in every window of every coat room. . . .

"The humidity of these rooms is practically that of the outdoor air and a temperature of comfort is more easily maintained."—*The American School Board Journal*, April, 1915.

⁂

"Statisticology."—A paper under the above title was read by Dr. C. V. Reynolds of the City of Asheville (N. C.) Board of Health before the Buncombe County Medical Society and also before the Tri-State Medical Society at Charleston, S. C., February 17, 1915. The paper was a detailed plea for more justice in the keeping and recording of morbidity and mortality statistics—justice to the city or locality into which fatal diseases such as tuberculosis are imported and justice to the other city or community from which the victims have come. The first place—due to the fact that a sanatorium of some kind is located there, is unjustly credited with a false and an abnormally high death-rate and the second is unaware of the prevalence of disease or at least may be deceived by its falsely low death-rate. One of the most valuable and legitimate uses of statistics, the writer points out, is in connection with public health and preventive medicine measures—and to the extent that statistics are unreliable and untrue, to the same extent is public health work dependent thereon blind.

Doctor Reynolds brought forward many statistics in support of his statements and showed several charts illustrating the injustice he is trying to combat. The remedies which he proposes follow:

"Allow each municipality to be responsible for every communicable, contagious, and preventable disease or death, which originated in her midst.

"Upon satisfactory proof of any communicable, contagious, or preventable disease, originating elsewhere, that disease shall be returned and recorded in the registration area in which the disease originated.

"All deaths occurring from imported diseases shall, upon satisfactory proof, be referred to the area in which such diseases occurred.

"All imported deaths, from non-registration areas, shall be compiled as such and reported to point of origin, also tabulated in the registration area in which the death occurred, for general information.

"All imported, contagious, communicable or preventable disease, from non-registration areas, shall be compiled as such, and reported to point of origin and tabulated as occurring in the registration area in which the disease occurred, for general information.

"With all possible emphasis, it is desired that my listeners be impressed with the dire need of statistical reconstruction,—not for the special benefit of the few, but for the good of the whole. Look not upon it with an impugning mind. Let us bend every effort toward a reformation, and accomplish much toward the prevention of preventable disease."

⁂

"Typhoid in the Immunized.—At a meeting of the Société médicale des hôpitaux, according to *Presse médicale* for March 18, 1915, P. Carnot and B. Weill-Hallé summarized their conclusions concerning fever in those inoculated against typhoid as follows: 1, In an immense majority of cases, preventive inoculation confers complete immunity; 2, in certain rare cases, those vaccinated have a light fever of typhoid type; bacteriological examination shows in these cases a paratyphoid organism, but oftener the typical bacillus; 3, insufficient immunization may occasionally be attributed to defective methods of vaccination; 4, the feebleness of immunity is connected sometimes with bodily weakness from overwork; 5, sometimes feeble immunity depends on the number and strength of the infecting bacilli; 6, even if immunization is not perfectly satisfactory, it will generally be noted that fever in those inoculated is benign, short in duration, and without complications."—*New York Medical Journal.*

⁂

Prophylactic Typhoid Vaccination.—In the *Wiener Klinische Wochenschrift*, February 25, Kirschbaum describes a method of typhoid vaccination which does not result in the local pain, headache, fever and general uneasiness to which the ordinary method often subjects the patient, although conferring equal immunity. He employs a twenty-four hour agar culture of polyvalent strains of typhoid bacteria containing about 600 million bacteria per cc. The bacteria are killed at 60 degrees, carbolic acid is added to make a 0.5 per cent. solution and 0.2 cc. is injected at the first treatment. Two weeks later 0.8 cc. is given and in another week the third dose of 1.5 cc., the sight of all injections being the left deltoid muscle.—*New York Medical Journal.*

⁂

Natural and Artificial Immunity in Diphtheria.—An article by Hans Kleinschmidt in Volume 3, No. 3, of the *Beigtrage zur Klinik der Infectionskrankheiten und zur Immunitätsforschung* has aroused considerable discussion in British and American journals.

By means of the Schick test it has been demonstrated that 93 per cent. of new-born infants have antitoxin in their blood no different from that which is artificially produced in the adult. At one year of age only 57 per cent. of these children remain immune. Thirty-seven per cent. of the persons between two and five years of age are immune, 50 per cent. of those between five and fifteen and 76 per cent. of those between twenty-one and forty. The above figures correspond very closely to the age distribution of the disease and coincide with the experimental evidence which shows that natural immunity of the mother is transmitted to the child *in utero.*

"The active immunization of individuals by means of inoculations with diphtheria vaccines, although a method promising much for the future is not as yet adapted to general use. Behring's toxin-antitoxin mixture, the exact composition of which is still withheld from the profession, when injected into an individual, sets up an immunity at the end of ten to fourteen days, a period so long as to render this method by itself of little value in the case of individuals who have been exposed to diphtheria and whom one may desire to protect. This disadvantage may be obviated, Kleinschmidt says, by the simultaneous use of passive and active immunization."—*Medical Officer*, March 20, 1915.

✣

The Menace of Syphilis to the Clean-Living Public.—"Every community is divided into two classes of individuals—those who have syphilis, and those who are exposed to it," writes J. H. Blaisdell at the beginning of his article in the *Boston Medical and Surgical Journal* of April 1st. In making the study upon which his article was based he examined sixty cases in the early stages as they came to the Boston Dispensary and the relation of their infectiousness to their associates. These sixty cases had exposed 134 people through coitus between the time of their infection and their appearance at the Dispensary. Four hundred forty-two others had come in contact with them in family and boarding house life, while 651 fellow-workers had been in danger of contracting the disease. Four of these sixty cases were extragenital and probably innocent. Of the 576 people exposed through coitus or family life, five were known to be infected, four through intercourse, one child through being kissed. Of the 571 equally possible infections, nothing is known.—*New York Medical Journal*, April 17.

✣

National Organization of Public Health Nursing.—In June, 1912, the association known as The National Organization for Public Health Nursing was established. This Association was formed for the correlation and standardization of local organizations, and the collecting of reliable morbidity statistics. There are now 2,066 local associations and 4,895 nurses, and the increasing demand for public health nurses because of their efficiency in promoting public health, education and healthful living is rapidly increasing this number. The local associations are composed of both professional and non-professional members who are interested in public health work.

The organization is interested in the possible development of sickness insurance with nursing care and the extension of visiting nursing to include hourly and household nursing. It stands for

1. Active coöperation and affiliation of all public health nursing in each community, represented by a central committee on which sits a director and executive officer of each association.
2. Sound business principles and methods of administration in local associations, as distinguished from the rôle of "charity."
3. A fee system rather than free service, thereby extending the benefits to others than the dependent classes.
4. Special preparation of nurses for public health nursing, both general and special, through
   (1) Post-graduate courses;
   (2) Undergraduate studies and practice.—*The Modern Hospital*, April, 1915.

✣

The Subcutaneous Tuberculin Test.—Dr. Oscar Holden draws the following conclusions concerning the tuberculin test from his experience which he describes in *The Antiseptic* for December, 1914:

"I. The subcutaneous test is not infallible; cases occur in which a negative result is obtained, but which, from the clinical side, are indubitably tubercular.

"II. The test should not be used unless the patient can be kept under close and skilled supervision, otherwise bad effects may occur. Even with all precautions decided ill-effects sometimes supervene.

"III. A focal reaction, when it occurs, is of the greatest value, but at rare intervals gives rise to erroneous deductions.

"IV. A general reaction with a decided rise of temperature is also of help but is not so valuable as a focal reaction.

"V. A local reaction has no more significance than the Von Pircuet test already dealt with.

"VI. The subcutaneous test should not be employed in the case of young children, obviously debilitated individuals and where the diagnosis can be made with some degree of certainty without its help."

⁂

Good Sense in Contagion.—Some facts which are worth remembering are stated in a recent article by Minnie Goodnow, R. N. In contagious diseases the sick person himself is the real source of danger, and infection occurs chiefly by contact. The fundamental principle of the modern contagious hospital is to let things alone. Only the doctors and nurses are allowed to touch the patient. When they do, they work as in a surgical operating room and afterwards they remove articles of clothing which may be contaminated and thoroughly scrub their hands, being careful not to touch surfaces which may spread the infection meanwhile. The layman needs to realize that bacteria are simply minute plants and that he should avoid contact with any discharge from the patient which contains bacteria or with any surface which may have been contaminated. And if such contact is necessary thorough washing of the hands should follow.

We should realize the folly of disinfecting and fumigating and appreciate the value of cleanliness. In the past we have pinned our faith to fumigation and neglected to wash our hands.—*The Trained Nurse,* April, 1915.

⁂

Protective Inoculation against Varicella.—The following is a brief summary of an article by Carl A. Kling which appeared in the *Berliner Klinische Wochenschrift,* January 4, 1915:

"The material for inoculation was derived from an active case of the disease in a child who was free from syphilis and tuberculosis and who showed no signs of any other infection. When the eruption is in its early stages vesicles are chosen which contain perfectly clear serum and which have not too much areola. Since the vesicles come out in crops, one patient will afford material for a few days. The virulence of the virus is probably greatest on the first day of the eruption, giving the greatest protection. The serum should be obtained under perfect aseptic precautions. The inoculation should be made with an ordinary vaccine lancet which is not too sharp; it is inserted into a vesicle of the patient and the clear lymph allowed to moisten its tip. The skin at the site of inoculation should be made tense, the lance inserted into it several times just far enough to draw blood. After about three stabs the lance should again be moistened with the serum from the vesicle. A total of three to six punctures should be made to insure success. One hundred and thirty-five patients have thus been successfully inoculated during an epidemic and only 23 per cent. of failures to produce immunity were recorded. After the inoculation, a light bandage is placed over the site for twenty-four hours. When local inflammation, the sign of success, appears, the dressing should be reapplied to prevent rupture of the delicate vesicle. In ten of the 135 inoculated children, a few vesicles appeared upon the upper portions of the body as well as at the inoculation site, and in three children a general varicella was produced."—*New York Medical Journal.*

⁂

Compulsory Vaccination.—The March issue of the *New York State Journal of Medicine* devotes considerable space to the above topic apropos to the so-called Jones-Tallett bill. It contains an article by Doctor Biggs in favor of the proposed amendment, two opposing arguments and an editorial setting forth the opposition of the medical profession to any change in the present law.

The old bill requires all children to be vaccinated before being admitted to the public school, and makes provision for free vaccination when necessary. The amendment proposes to abolish compulsory vaccination but provides that whenever smallpox exists in any vicinity and the state commissioner of health or local board of health shall so certify in writing to the school authorities, the latter shall exclude from school every child unable to furnish a certificate from a physician that he or she has been successfully vaccinated. The board of health shall provide for vaccination and the municipality shall bear the expense incurred. Vaccination may be performed by a physician at such periods of the year as may be prescribed by the State Commissioner of Health. This bill will not effect the large cities.

The new bill originated from the opposition of rural communities (noticeably the case of

Niagara Falls), to compulsory vaccination because of its supposed dangers.

The main arguments for the proposed amendment are as follows:

(1) Public sentiment opposed to present law would support the proposed measure. (2) The coöperation of public sentiment is essential to health work. (3) The cases of smallpox in recent years are light, both because of the effect of vaccination and because of the non-existence of virulent strains. (4) Because of non-enforcement of the present law there are as many non-vaccinated people as there would be under the new law. (5) Although the virus is pure some evil results are likely to follow vaccination because of later infections. (6) The proposed bill will allow for vaccination when needed. (7) It will place authority with the commissioner of health, where it belongs. (8) It has been practically impossible to enforce the present law.

In opposition to this the following respective claims are made:

(1) The best judgment of the medical fraternity rather than public opinion should be the controlling factor. (2) The public is more indifferent than opposed and could be educated. (3) Reduction in virulence of the disease is directly dependent upon vaccination. (4) The new law would bring danger because more unvaccinated people would make great epidemics possible. (5) Statistics of compulsory vaccination in all parts of the world show that proper care removes practically every danger. (6) The proposed bill will permit frequent outbreaks of the disease. (7) The efficiency of the commissioner of health will be blocked by lack of the coöperation of local authorities. (8) Compulsory vaccination could and should be enforced by educating the public.

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Meat Poisoning.—Dr. L. C. Frost begins an article on the above subject in the February *American Medicine* by defining the following terms essential in a discussion of meat poisoning as follows:

"1. Ptomaine. A non-specific, alkaloidal poison; a half-way decomposition product of proteids when acted upon by putrefactive bacteria.

"2. Leukomaine. (Gautier) An auto-lytic non-specific, half-way decomposition product. Formed by the action of self-contained enzymes, and not by bacteria.

"3. Toxin. A specific, poisonous proteid; the secretory or excretory product of bacterial life.

"4. Intoxication. A morbid condition caused by absorption of poisonous non-living matter.

"5. Infection. An invasion and the morbid results of an invasion by living pathogenic or putrefactive bacteria."

Although the ptomaines and leukomaines were formerly thought to be responsible for epidemics in meat poisoning, the study of Van Ermingen shows that in 112 epidemics of food poisoning, 103 epidemics or 92 per cent. of them were caused by meat taken from animals suffering from septicemia, pyemia, enteritis and other bacterial diseases. The old idea was based upon experiments by intravenous injections and we now know that when absorbed in a normal manner from the digestive tract most ptomaines can produce only a mild irritation and intoxication. The evidence at hand shows that most of the trouble arises from meat which was infected by bacillus enteritis and allied organisms before the death of the animal or by bacillus proteus, coli, or botulinus through frequent handling or inadequate preservation.

The author continues with a study of the pathology of meat poisoning with special reference to botulismus.

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Infections of the Genito-Urinary Tract in Children.—The April *American Journal of the Diseases of Children* contains an article by Dr. R. M. Smith summarizing the literature of 1913 and 1914 on the above subject, giving references to the original articles. Some of the points brought out follow:

The existence of a rather large amount of gonococcus infection in the form of vulvovaginitis presents an unsolved problem. This is contracted in most cases from parents or from other girls of the same age, one of the most common sources of infection being the common toilet. Some of the preventive measures suggested are (1) the installation of a drop of 2 per cent. silver nitrate solution in the vestibulum vaginæ of all new-born girls whose mothers show evidence of gonorrhea, (2) instruction of parents by the visiting nurse regarding preventive measures,

(3) investigation by the visiting nurse of the origin of the infection and (4) the adoption of a "U-shaped" seat with low bowl and other precautionary measures in all public lavatories. The treatment employed consists of local applications of 2 per cent. silver nitrate solutions and the injection of vaccine.

Pyelitis or inflammation of the kidney or pelvis is most commonly caused by the bacteria of the colon group. It is less common and more frequently preceded by constipation among boys than among girls. This leads to the belief that the infection may be both from the colon by means of the blood and from without *per urethram*. The value of vaccine therapy is still much in doubt.

Renal and genital tuberculosis in children are both rare and originate from a variety of sources.

*

Simple Cure for Riggs' Disease.—The following article was sent out last month by the North Carolina State Board of Health.

"Nearly everybody has Riggs' disease. Dentists tell us that at least 95 adults out of a 100 have it to a more or less extent. This disease has baffled dentists for years. The loss of about half the permanent teeth is said to be due to this obstinate chronic disease. Now it is claimed to be curable. Thanks to science!

"Riggs' disease, or pyorrhea as the dentists call it, is a chronic disease of the gums, or rather the membrane that surrounds the roots of the teeth and lines the sockets of the gums. It causes the gums to gradually recede from the teeth, exposing the more delicate neck of the tooth and giving the teeth an elongated appearance. This process continues and in the course of years causes the gums to bleed easily and to become sore and ulcerous. It finally causes the teeth to become loose and almost drop out.

"Now it has been found that all this trouble is due to a peculiar germ that destroys this membrane which surrounds the root of the tooth and which lines the socket in which it rests. This particular germ is readily destroyed in from three to six days' treatment.

"To begin the treatment one should consult a dentist and have the teeth thoroughly cleaned. Deposits of tartar or yellow calcareous matter which accumulates, particularly along the inner edges of the teeth and between the teeth, should be removed, as these deposits irritate the gums and furnish lodging places for many kinds of germs. After the teeth are cleaned, or even before cleaning, one should begin the use of some form of the drug ipecac. This is conveniently taken in tablet form under the drug name of alcresta ipecac. Directions for taking the ipecac usually accompany the drug or any dentist can furnish the information. Emetine, a similar drug, is sometimes used with equally good results.

"To prevent reinfection, which is very easy, particularly with the use of common drinking cups, it is recommended that in washing the mouth and teeth a drop of a solution of one part fluid extract of ipecac to ten parts alcohol be used on the wet tooth brush. The use of one drop of this alcoholic solution as a mouth wash on a wet tooth brush should be continued regularly at least twice a day to prevent reinfection."

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Baby Hygiene in Boston.—In 1911 Boston had an infant mortality rate of 125 and ranked seventh in the list of the ten largest cities of the United States—in the order of low infant mortality rates. Last year with a rate of 103.3 Boston ranked second to New York City alone. At least one of the most important factors in this rapid and desirable reduction is the work of the Boston Milk and Baby Hygiene Association. Last year, 4,097 babies were cared for and so efficiently was the work organized that the cost per baby per year was only $12.50. The Sixth Annual Report of the Association, which has just been published, gives the above interesting figures as well as many others and outlines the encouraging progress made last year. The organization has no endowment—the $23,000 expended last year being furnished by voluntary contributions.

To effect its purpose of keeping babies well, the Association follows three principles:

(1) The encouragement of breast feeding.

(2) The provision of pure milk at cost to mothers unable to nurse their babies sufficiently or at all.

(3) The teaching of mothers, through the supervision of skilled physicians and specially trained nurses.

One of the most interesting and significant facts in relation to the work of the Association during the past year is that of the 83 deaths occurring among babies under the care of this organization—28 were due to pneumonia and 24 to gastro-intestinal disorders. This was the first time that the number of respiratory diseases has exceeded that of the intestinal group in "Station" babies.

*

Effects of the Harrison Law.—"When the Harrison law became effective, March 1, it was widely predicted that the result would be a besieging of hospitals by crazed drug addicts, a crime wave of national scope and a trail of suicide and death across the country. A month has passed, and while the results have not been as terrible as the early hysteria painted them, have not even approximated the glaring headline predictions of the yellow press, they have nevertheless, been apparent to physicians and to others who come in daily contact with drug traffic. In the Philadelphia General Hospital—and this is true of practically every hospital in the country in which drug addictions are treated—the number of admissions has greatly increased. Without doubt the law has forced numerous habitués, who otherwise might have been satisfied to continue as such, to apply to physicians and institutions for treatment. Further, there is no doubt that the large majority of these unfortunates will be freed of their habit. The increased admissions to these hospitals do not represent an increase in drug addictions; they are simply an objective manifestation of the operation of the Harrison law."—*Journal of the American Medical Association*, April 10, 1915.

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Court Upholds Tuberculin Test.—*The United States Public Health Report* for April 9, records the following decision by the Mississippi Supreme Court.

HAWKINS *v.* HOYE et al., 66 S. Rep., 741. Dec. 14, 1914.

"The legislature by virtue of the police power of the state, may enact all needful laws for the purpose of preserving the health, preventing the spread of disease, and protecting the lives of the citizens. It may create boards of health and bestow upon them necessary powers to protect the general health of the people.

"Statutes establishing boards of health and investing such boards with the power to adopt ordinances, rules, and regulations necessary to advance the public health are not unconstitutional as being a delegation of legislative power.

"The requirement that the cows used in the dairy business, where milk therefrom is sold generally to the people, should be inspected as to their health twice during the period of a year is valuable in the preservation of the public health and not an unreasonable regulation.

"Such a regulation does not violate the constitution of Mississippi nor section 1 of the fourteenth amendment to the Federal Constitution.

"The purpose of such a regulation is to prevent the spread of disease among human beings, and its promulgation and enforcement by the State board of health, rather than by the live stock sanitary board, was proper.

"REED, J.: Appellant operated a small dairy in Lauderdale County near the city of Meridian. He owned 11 cows which were in use for milk in his dairy business. He brought this action at law for damages which he claimed to have suffered from the rejection of 6 of his cows upon an examination of them for tuberculosis and other contagious and infectious diseases. He charged in his declaration that the examination and rejection of the cows were without authority of law and wrongful. To the declaration appellees filed the plea of general issue and special pleas. Appellant demurred to the special pleas and, his demurrer being overruled, appealed to this court. . . ."

The opinion then gives at considerable length, reasons for the decision—and cites numerous supporting decisions.

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"Diagnosing a Nation."—The following brief summary of the Official Report for 1914 by Surgeon-General Blue of the United States Public Health Service appeared in *The Survey* recently under the above title. This report is one of the most comprehensive and valuable of the Service publications.

"The report discusses briefly the year's work in scientific research, quarantine, sanitary surveys and statistics, marine hospital and relief, personnel, and publications.

"Officers of the service who have studied malaria, especially, state that it is usually failure to recognize the relation between this disease and unsanitary conditions, to guard milk and water supplies, and to provide and enforce suitable health laws, that has made malaria so acute a problem in many parts of the United States. It has been their experience, however, that when such conditions and the measures necessary to control them are brought to the attention of local officials, and others directly concerned, prompt action in a large majority of cases immediately follows.

"Pellagra investigation has centered especially at places that gave opportunity for special study of the causes, manifestations, and dietary treatment of this disease. Research will be continued during the present year.

"Trachoma investigations carried on especially among school children, and in certain mining regions of the South, have resulted in some interesting discoveries. Contrary to general impression, negroes, though not immune, are found much less widely infected than are white people. Also, the foreign element is a negligible factor in the problem. Trachoma seems essentially a disease of the native population.

"Among miners, trachoma seems to be due to locality rather than to conditions in the industry, though the drifting of miners from place to place is an important consideration in the spread of infection.

"The investigators recommend systematic examination of school children, exclusion of infected children from school, employment of school nurses, free special trachoma hospitals, coöperation of mining companies, better sanitary conditions, and thorough education on the subject in infected regions.

"Tuberculosis; typhoid; occupational diseases; some local outbreaks of smallpox; and sanitation in rural districts, schools and railroads, are among other important matters included in this report. Laboratory results are stated to have utterly condemned the widely exploited Friedmann treatment for tuberculosis, and to withhold for the present any approval of the claims of the Doctors von Ruek.

"The important and too little known work of the Hygienic Laboratory is briefly told; also the maritime, insular, and foreign quarantine system, and the special precautionary measures against plague.

"Surgeon-General Blue indicates as the immediate needs of the Public Health Service increased personnel and appropriation for both scientific and clerical work; an additional building and equipment for the Hygienic Laboratory; and means of meeting the demand for literature on health subjects, a demand which has greatly increased beyond the present means of supply."

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Simple Trap for the House-Fly.—A maggot trap which will practically prevent the breeding of the house-fly is described in a new bulletin of the United States Department of Agriculture, No. 200, "A Maggot Trap In Practical Use; An Experiment in House-Fly Control." The investigators who carried on this experiment at the Maryland Agricultural College declare that during August and September at least 98 per cent. of the larvæ breeding in the manure were destroyed, and although the trap was not so efficient when the weather became colder, even then it greatly reduced the number of flies.

The principle of the trap is simple, it is easy to construct, and the expense is said to be probably less in the long run than the investment which many farmers now make in screens for their dwellings, and sprays and fly-nets for their live stock. In its roughest outlines the trap consists of a concrete basin with a latticed wooden platform erected upon it to hold the manure. The basin is connected by a drain pipe with a small concrete cistern. The bottom of the basin is filled with water into which the maggots breeding in the manure drop, as they are about to turn into the pupa or chrysalis stage, and are drowned. At frequent intervals the water is run off into the cistern and is then pumped back on the manure pile. In this way all the liquid manure is saved.

The successful operation of this trap rests upon several facts connected with the habits of the house-fly which have been thoroughly established by observation. The adult fly lays its eggs in fresh manure. There they remain until the larva stage is almost over and the insects are about to enter the pupa or chrysalis stage. At this time a pronounced tendency to migrate is evident. In consequence, if the manure is placed upon a platform with a lattice-work bottom, the larvæ, while migrating, will fall through these openings into the water in the basin below. In the case of the experiments at the Maryland Agriculture College a careful count showed that between July 25 and October 1 about 112,000 larvæ were killed in this way. This, however, does not include the number that were picked up from the basin by sparrows or poultry. Altogether it is estimated that during the warm weather the efficiency of the trap was probably 99 per cent. Later, when the temperature was lower, the trap's success was not so marked. This was accounted for by the fact that when the air is much colder than the manure heap the larvæ will not attempt to leave the heap and therefore will not fall into the basin.

Another difficulty experienced arose from mosquitoes using the water in the basin and the cistern to breed in. This was overcome by cleaning out the basin at regular intervals and by sprinkling a little oil over the surface of the water in the cistern.

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Medical Milk Commissions and Certified Milk.—The first bulletin in the new departmental series of the United States Department of Agriculture is a contribution from the Bureau of Animal Industry entitled Medical Milk Commissions and Certified Milk; this is a revision of a previous bulletin on the same subject.

The organization and objects of the first milk commission are described and the origin and meaning of "certified milk" are set forth. The word "certified" has been registered in the United States Patent Office and may only be used by a duly organized medical milk commission.

The first milk commission was organized in 1893. Since that time over 60 commissions have been established but nearly one third of that number are inactive at present.

About 125 dairies are engaged in producing certified milk and the daily production is nearly 25,000 gallons, an increase of 300 per cent. in five years. While this seems a remarkable increase, it should be remembered that only about one half of 1 per cent. of the total milk supply of the country is certified.

While the chief demand for certified milk is for infants and sick people, it further serves to teach the public the value of careful methods in milk production and the extra cost of absolutely clean milk.

The bulletin described the equipment and methods necessary for the production of certified milk. It is pointed out that expensive equipment is not a necessity so much as a careful and unremitting attention to details.

In 1907 the American Association of American Milk Commissions was organized. The methods and standards for the production and distribution of certified milk adopted by this association at its 1912 meeting are given in the appendix to the bulletin.

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Liverpool School of Public Health.—"The Liverpool City Council has recently received instructions to proceed with the erection of a building for the Liverpool School of Public Health. With this School will be associated the departments of the Professor of Bacteriology and the City Analyst. A fine site, about 980 square yards in area, has been secured adjoining the main University buildings.

"The advantage of bringing these three departments of hygiene under one roof is very great. The result will be a more comprehensive provision for the needs of the city and report in the matter of sanitary administration, while the School of Hygiene will be equipped for the teaching of all branches of public health. Application is being made to the local Government Board for power to borrow $97,000 for the cost of building, toward which the University School of Public Health will contribute $15,000, besides a yearly rental of $1,500 plus a third of the rates."

The American City, October, 1913.

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An Unfortunate Delay.—By failing to repeal an amendment, which the State Board of Health thinks is useless and unnecessary and to which the federal government objects very strenuously, the North Carolina legislature has doomed its state to remain in the non-registration area for another year at least. The amendment was passed with the original "model law" for registering births and deaths last year and due to the fact that the significance of the amendment, the State Board thinks, was not properly understood, the House failed to pass the bill which called for its repeal. Although the state has a law which costs $10,000.00 a year to execute, it is not recognized and is ranked with the other twenty-five states who have poor registration laws or none at all.

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Public Health Surveys.—Public health surveys continue to increase in quality and usefulness. The surveys made by the Department of Surveys and Exhibits of the Russell Sage Foundation may be taken as typical. During the past year this department has published "A Public Health Survey of Topeka," a pamphlet of 98 pages with many illustrations, which discusses in considerable detail the city's vital statistics, sanitary conditions, and health department. Attention is given to the distribution of preventable diseases throughout the city and to the tuberculosis, infant mortality and venereal disease problems. Other matters receiving attention are the city water supply, sewerage and sewage disposal, milk supply, food supply, and wells and privies. Recommendations are made to meet the individual problems and the entire situation. It is urged that an investment in the health department will probably, dollar for dollar, save most lives, and that a full-time trained health officer is necessary. During 1914 the Department of Surveys and Exhibits also made public health surveys of Ithaca, N. Y., and Springfield, Ill. Considerable effort is expended to bring the findings home to the people, both in the preparation of the printed reports and through exhibits and newspaper publicity. Among the lessons of these surveys are the unexpectedly large numbers of wells and privies found (about 7,500 of each in Springfield, a city of about 58,000 population), the relatively greater frequency of communicable disease in the poorer districts, and the neglect by the city of some of its most important health problems and of its health department.

Industrial Hygiene and Sanitation.

Prescribes "Self-control."—George M. Price, author of "The Modern Factory," in an address on "Factory Hygiene" December 18, 1914, stated that in his opinion real progress in industrial hygiene can only be made through a "system of industrial self-control."

"It is my claim," said Doctor Price, "that for the achievement of best industrial conditions, for the gain of workers in industrial hygiene, reliance can be placed neither upon the pure benevolence of the employers nor upon the fear of state interference and punishment, nor upon the rising might of the labor movement, nor even upon the very plausible theory of industrial efficiency.

"Real progress in factory hygiene and real improvement in industrial conditions, can only be achieved when industries are organized in special groups; when each industry is organized as a separate unit, and is given the right and power to control its own destinies, to propound its own sanitary and safety standards, to evolve improvements especially adapted to its own needs, and to enforce its own regulations without fear or favor from outside sources; in other words —a system of industrial self control."

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Reporting of Occupational Diseases.—What is the best method of securing the accurate and complete reporting of occupational diseases? The efficacy and necessity of such reporting is no longer an open question.

Only time can tell how the payment of a fee of fifty cents by the State Board of Health of California to the physician for every properly filled-out notice sent in of lead, phosphorus, arsenic, mercury poisoning, anthrax or "caisson disease," will work out. This plan, tried out in Connecticut, brought in returns from only three cases between September 1, 1911, and February 13, 1912.

The 1913 Connecticut law placed a penalty of $10.00 on each failure to report such diseases within forty-eight hours.

Whether this will be a more feasible solution is still possibly open to doubt, but it is a fact that between January 1, 1914, and November 1, 1914, 27 cases of occupational disease were reported.

*

"For You."—Number 1 of Volume 1 of *Industrial Hygiene* has just been issued by the Ford Motor Car Company. Its avowed purpose is the promotion of the health and safety of the Ford employees.

The first number tells of the private hospital maintained by this profit-sharing company, of the organization and work of the "Central Safety Committee" and of the legal department maintained in the interests of the employees. The leaflet is printed only in English. A new issue is given out in each pay envelope.

The following, under the caption, "The Hospital," illustrates the general style of the leaflet:

"The hospital connected with the Ford factory is equipped to handle all emergency sick and accident cases occurring in the shops. An efficient staff of physicians is constantly prepared to render first aid at all times.

"The hospital is located across the hall from the pay office. It is easily reached from all parts of the factory.

"The hospital is not intended to serve as a free dispensary at all times, but aims to give prompt and efficient relief to all cases of accidental injury taking place during working hours.

"Be quick to use the hospital in case of injury. When a fellow workman is injured, notify your foreman, and help take him to the hospital without delay.

"Don't think any cut or scratch is too slight to take to the hospital. A very small wound may lead to serious blood-poisoning if you allow dirt to get into the sore.

"After you have been to the hospital, follow closely any directions they give you."

*

Lead Poisoning in Storage-Battery Industry.—Bulletin 165 of the United States Bureau of Labor Statistics gives the results of an interesting study of lead poisoning in the manufacture of storage batteries. The summary of the bulletin follows:

"The ordinary storage battery, not the Edison, consists of plates of lead, or of lead grids covered with a lead oxide paste. In the preparation of these plates and grids the workmen are exposed to the danger of lead poisoning through dust of metallic lead and through fumes from melted lead.

"In making and applying the paste the workmen are exposed to still greater danger of poisoning from the oxides of lead.

"The subsequent processes of assembling, lead burning, etc., involve exposure to the fumes of melted lead and to the dust from dried oxide paste.

"These dangers can be obviated by installing hoods and exhausts to carry off fumes and dust, by substituting machine for hand work, by providing ample washing facilities for the workmen and insisting on strict cleanliness on their part, by providing a separate lunch room as the only place where food may be kept and eaten, and by keeping the premises where the work is carried on clean and free from dust.

"Inasmuch as some risk always remains after all possible precautions have been taken, there should be thorough medical supervision of the men in order to detect and eliminate those who are oversusceptible to lead, to discover cases in the early stages, and to give instructions to the men on the care of themselves.

"By using precautions such as these, German and British employers have greatly reduced the amount of lead poisoning in factories of this kind. In the largest German factory the rate of poisoning in 1912 was 0.97 per 100 employed, and in Great Britain the rate for all factories during this same year was 3 per 100.

"In the United States the five largest factories were during 1913 employing about 915 men in work which exposed them to lead. It has been possible to discover 164 cases of lead poisoning which occurred among the employees of these plants in this one year. This makes a rate of 17.9 per 100 employed.

"The largest proportion of lead poisoning occurred among the men handling lead oxides, the lowest among those handling metallic lead only. The disease was usually typical acute lead poisoning, with gastric symptoms predominating, but even an acute attack often resulted in incapacitation from work lasting for several weeks to two months or over. Out of 40 cases, 23 had marked nervous symptoms. Chronic plumbism was rarely found, since the men hardly ever remain long at the work.

"The employees in this industry in the United States are for the greater part of foreign birth; many speak no English and are ignorant of the dangers of the work, or if they recognize the danger, do not know how to protect themselves against it.

"The difference between the American rate of lead poisoning and the British and German rates must be explained by the different standards of sanitation and management in this country as compared with those of European countries. None of the five large factories in the United States comes up to the British or German establishments in cleanliness or in the removal of fumes and dust, and only one provides as careful medical supervision. Smaller factories in this country are even less well managed.

"The three states in which the five largest factories are situated have already passed laws which cover this industry and provide safeguards for the men engaged in it, and, if these laws are strictly enforced by intelligent factory inspectors, there is no reason why our record of lead poisoning should not fall, as it has fallen under intelligent supervision in Great Britain and Germany."

⁂

Unique Record.—The Hudson and Manhattan Railroad has recently submitted to the American Museum of Safety its record of the year ending June 30, 1914, in competition for the Anthony N. Brady Memorial Medals.

During the year, 2,518,313 train miles were run and 59,981,011 passengers were carried. Notwithstanding the enormous volume of the traffic, only one fatal accident occurred, in which a trespasser was killed. There were only 165 injuries, including industrial accidents—and not one of these occurred in train accidents.

⁂

Regulates Painting Business.—The State Board of Labor and Industries and the Industrial Accident of Massachusetts have issued a public notice of the following regulations pertaining to the painting business in Massachusetts,—the rules to take effect on May 1, 1915:

1. It shall be the duty of every corporation, association, firm or person engaged in the painting business, and employing one or more persons, to transmit, by mail or otherwise, a written statement, within thirty days after the passage of these rules and regulations, to the State Board of Labor and Industries giving the name under which, and the city or town and street with the number in which the business is carried on. Every corporation, association, firm or person hereafter engaging in the said business shall transmit the statement, as aforesaid, at least five days before beginning business.

2. It shall be the duty of the Joint Board, at any time, or upon complaint, to inspect rigging. When rigging is found to be unsafe, the Joint Board shall give written notice, without delay, to the employer, drawing his attention to its unsafe condition. The employer shall not again use the unsafe rigging until it is made safe by the employer, in accordance with the directions of the Joint Board. (Chapter 813, Acts of 1913, Section 13: Whoever violates any reasonable rule, regulation, order or requirement made by the Joint Board under authority hereof, shall be punished by a fine of not more than one hundred dollars for each offence.)

"Rigging," as used in this rule, shall mean ropes, blocks, ladders, planks, trestles, brackets, and all other form of supports.

3. No employer shall use or allow to be used ropes where acid has or may come into contact with the same.

On all staging swinging thirty or more feet from the ground, guard rails shall be provided.

When an extension ladder, or several ladders are used for a bed stage, there must be at a fall each intersection. and such intersection tied together.

There shall be no more than three men on a two fall stage, and where the falls are more than fifteen feet apart, a third fall shall be used.

When not in use, rigging shall be housed or suitably covered and protected from the weather, in a manner satisfactory to the Joint Board.

(Note.—In the interests of occupational and public safety, the Joint Board recommends that painters discontinue the practice of loaning rigging.)

Accompanying the notice of the above regulations were the following "safety rules for employees" and "health hints":

1. Never use a ladder with a damaged side or rung.

2. In ascending a ladder never take hold of the rungs; always take hold of the side.

3. Never straddle and slide down a ladder (the so-called "fireman way").

4. In holding an extension ladder while being raised, always hold by the sides; never hold by the rungs.

5. In footing a ladder pull with the man underneath; by so doing you will hold the foot more fast, and help the man to raise the ladder.

6. Never foot a ladder on a wet or frosty roof.

7. Always make a solid footing for your ladder; never use small blocks to build a footing; if it is necessary to build a footing use boards two or more feet long, and in all cases see that the footing is firm.

8. Never leave your ladder where it will be injured, or lying on uneven ground where it will twist or strain the sides.

9. Test the gutter or roof before hanging stage.

10. See that the falls always hang plumb.

11. Never hang a fall with a dip, a twist, or out of square with the roof hooks.

12. See that the spreader straps are close to the side of the ladder.

13. In hanging stage see that there is sufficient spreader to steady the stage.

14. See that the spreader is square with the stage.

15. Always lap the stage boards a safe distance to prevent tip holes on stage.

16. When the coping or other obstructions make it impossible to steady with the spreaders, see that the stage is made fast to the side of the building.

17. See that the falls hang not over four feet from end of stage to make it steady and well balanced.

18. Never allow the spreader roll to hang on a blind hook, a projection, or on the edge of an opening where the motion of the stage is liable to make it jump or jerk.

19. Two or more men should not congregate in one spot on a stage to create an excessive strain and unbalance the stage.

20. When working on a stage, do not lean against the building.

21. Never jump on a stage; the sudden jar is liable to unseat a hook.

22. In making fast the hitch on a stage, see that the pull line is square across and well bound.

23. In making fast the block hitch, hold fast on hauling line with one hand until the hitch is secure.

24. Never allow the ropes to chafe or rub on sharp stones that are found outside new houses, etc.

25. Never throw any part of the rigging from the roof, or about in any way, as it is liable to injure same.

26. See that the fall ropes are safe from being caught or pulled while stage is hung.

27. Never leave the falls in a damp place.

28. Report to the employer any defects in ladders or rigging.

29. When standing in the gutter always face the roof, toes in the gutter; never stand with heels in gutter.

30. Never wear torn overalls or shoes.

31. Never stand on a paint pot to reach from a stage.

32. If a man is subjected to fits, dizziness, light-headedness or has an inclination to jump, he should so state at the time he is requested to go into places unsafe for him.

33. No employee shall suffer loss of employment for reporting or objecting to use of unsafe rigging.

HEALTH HINTS.

Habits, as well as the occupation of painters, are dangerous.

1. Keep the general health always good, by plenty of light, good food and fresh air in the home. Sleep at least eight hours every night.

2. Personal cleanliness is important.

(a) Wash with warm water and soap daily, and always before eating.

(b) Take at least one full hot bath a week.

(c) Keep the nails and quick of the fingers clean.

(d) Do not wear the same clothing on the street or at home as that in which you work. Use overalls.

(e) Take good care of teeth and gums.

(f) Do not hold handles of paint brushes in the mouth.

3. It is dangerous to chew tobacco or gum when working. The lead on the fingers is sure to be swallowed.

4. The constant use of alcoholic beverages tends to lessen the resistance of the body to lead poisoning. Alcoholic drinks should be avoided. They do not counteract the poison, but act with it, and cause injury to the kidneys.

5. Drink as much milk as possible. Milk, eggs and other albuminous foods counteract the poison. Always eat a good breakfast before going to work. Especially, drink milk.

6. Have at least one good bowel movement every day. Use epsom salts occasionally.

7. Do all you can to keep down dust. Do not get lead on your hands and clothes any more than you can possibly help.

8. Bandage cuts or bruises carefully to keep out dirt and paint. Apply alcoholic iodine to fresh wounds to prevent infection.

9. At the very first sign of not feeling well, consult your physician.

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TRUTH IN PUBLICITY.

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Superintendent of Health, Providence, R. I.

Chairman's Address. Section of Public Health Officials, American Public Health Association, Jacksonville, Fla., December 1, 1914.

THE modern world believes in education. The adult citizen as well as the child needs instruction. People are trusting less to legislation and more to education. Organizations as diverse as the New York Central railway and the American Social Hygiene Association are conducting campaigns of publicity. With this educational movement I am in hearty accord. It would appear almost an axiom that the teacher should teach the truth. Yet there are many to whom this does not seem to have occurred. If the tares of error are sown among the wheat they are sure to spring up and many a summer sun will come and go before they wither and die. Science is merely truth systemized. Though a distinguished sanitarian has told us that sanitary science should be tempered by common sense, it was spoken in jest. It is not real science but only the pseudo-science of the amateur which needs to be, not tempered, but thrown out root and branch.

In the past, many errors have been taught by alleged sanitarians and enthusiastic reformers of many kinds. Some of these errors are still entrenched in the minds of the public to plague us and hinder progress. Errors often did, and do, masquerade in the name of science, but they are not her offspring.

In the early days of public health work we copied the errors of our European teachers and added to them. There was little real science. Untested theory, or often pure fantasy, dictated sanitary procedure. Let us turn to the teachings of the seventies and eighties of the last century. The environment was then the field for sanitary effort, not the person. Out of about 800 pages of Parkes' Hygiene, only 27 are devoted to the contagious diseases proper. The soil was in those days thought to be a common source of disease. The foul emanations from the decomposing organic matter were sucked up from cellars by the warm air of the house and carried sickness and death, ergo, if one would live, make the cellars impervious with asphalt. One state official writes,

"There can be no doubt that the ground-air under the village of ——

is seriously contaminated with general filth and specific enteric poison, and that this is liable to pass into any or every house in the village, carrying the seeds of disease with it. The ground air is not only drawn into houses by heat, but with every rise of the sub-soil water it is forcibly expelled from the ground into the houses and the streets. This air comes loaded with polluted moisture and may be either the cause of typhoidal or malarial fevers, or of dysenteries, diarrhœas and consumption."

The supposed danger from cemeteries is well illustrated by answers to an inquiry for opinions sent out to sanitarians. One writes:

"If one thing in sanitary science is better settled than another it is that decomposing human bodies pollute both the air above the ground, the ground itself, and the water that percolates through the ground. Polluted air and poisoned water are certainly detrimental to public health."

Another says:

"I do regard the presence of a cemetery, either large or small, in a city, as detrimental—yea, very dangerous—to the public health. I think poison enough may be derived from one human body to contaminate the well water and the air for a long distance under favorable circumstances for its diffusion. I should hesitate much to drink or use the water from a well situated one-half mile from a cemetery, if the intervening soil was gravelly or sandy, unless said water had recently been subjected to a searching chemical examination."

Filth, we were told, was the principal source of disease. In it bred hypothetical germs, or from it arose still more hypothetical gases. The pig pen, the garbage bucket, the trash pile, the manure heap and the privy vault were equally dangerous. How exasperating to us, who appreciate the evidence that only certain kinds of dirt are dangerous, is the persistent error that all dirt is dangerous. Belief in the supreme importance of dirt as a cause of disease persisted long and at the close of the Spanish war Colonel Waring was sent to clean the city of Havana and so exterminate yellow fever. He did clean it but the fever was more virulent than ever and only the real science of Reid and its brilliant application by Gorgas conquered this pest of our tropics. Even the less obtrusive forms of dirt were dangerous. Listen to what one writer says.

"A prominent physician reports the occurrence in the northern part of the state, of twenty-seven cases of severe typhoid fever, some of them fatal, the direct result of the unhealthy influences of a damp and uncleanly cellar."

"To prevent the emission of ground, air or soil moisture from the cellar bottom or sides, the sides must be laid in good hydraulic or asphaltic cement, and the bottom in the same, or in alternate layers of asphaltic cement and felt saturated with bitumen."

"Disease is also sometimes caused by half cleaned or neglected cupboards, closets, pantries, or provision rooms, where bits and crumbs are left to decay."

"It is not necessary, however, that contaminated water, or the effluvia of surface or pooled filth, or uncleanly cellars or pantries, should be sufficiently poisonous, to produce directly and obviously the common diseases of summer, to be sources of danger; for other derangements of the human economy, varying with the constitutional peculiarities of individuals, may be as easily induced by the same causes; and in absence of any or all acute diseases, it is quite probable that very many of the obscure ailments of numerous persons, not immediately dangerous, have the same origin, and are consequently so perpetuated; making the victim's life almost intolerable with aches and pains, and functional disturbances of the nervous system, the stomach, bowels, kidneys and other organs almost endless."

"The great, the indispensable remedy is cleanliness, and not only of inanimate but of animate bodies also, for filth is the same disease-producing agent, whether upon the surface of the earth, or in or about the habitations of man, or incrusted upon the surface of human bodies."

A dead human body was long considered a great menace. Dead from contagious disease it might cause an outbreak. This theory gave rise to burdensome restrictions as to transportation and funerals which no one, now that we have taken pains to study the subject, would ever think of enacting. The mind of the sanitarian was [illegible]ed with the idea that dead things are more dangerous because of contagion than are the living, hence the fear of fomites and the worship of disinfection, though no one seems to have made even an effort to find out whether disinfection is really necessary.

Air was the chief vehicle of infection, nay, it was infection itself. The emanations from cellars and untidy cupboards which dealt death and destruction through the house have been referred to, as well as the more specific effluvia which gave rise to yellow fever, consumption and diphtheria. Conditions became even more terrible when evidence began to accumulate that living germs, not gases, were the cause of infectious diseases. Listen to what was taught in 1878 in my own state.

"These germs, by their exceeding lightness, may separate from any of the emanations from the body, either after having been thrown out upon the surface of the ground, and rising therefrom to be wafted away in the currents of the air, to infect some other person or persons, weeks or months afterwards, and the scores of miles away, or, separating immediately in the sick chamber from the breath, perspiration, scaling off, or other discharge from the body, may rise and floating about in the room, infect some unwary caller, to find lodgment in some nook or crevice, or on some shelf, moulding, sash, ornaments, curtain, drapery or other clothing, to be again dislodged from their resting places, weeks, months or years afterwards, to affect some casual visitor or new occupant, or be carried away in articles of furniture, ornaments or wearing apparel, to spread infection and carry dismay to other persons, and in other localities."

There is little wonder that, when a few years ago we sought to establish a hospital for contagious disease, the neighbors rose as one man to protest against the outrage. Scores of them now spend their Sunday afternoons in our pleasant grounds.

The discovery of vaccination against smallpox was a fine piece of scientific work but it was sadly marred by an assumption entirely unwarranted, that when performed in infancy it will protect through life. After a time this was found not to be true but this mistake more than anything else developed and kept alive the propaganda of the anti-vaccinationist. The opprobrium of our art is that preventive medicine, like its other branches, has taught much that has had to be unlearned. We ought not to be surprised that the people do not believe all we say, and often fail to take us seriously. If their memories were better they would trust us even less.

The methods of science when applied to the problems of life rarely discover the exact truth and the whole truth. Scientific knowledge is a growing plant. New leaves are continuously budding from the old. Rarely does it need pruning and its solid branches shall never be cut away. Jenner proved beyond question the protective power of vaccination, a truth which will always stand, but it remained for others to determine how universal is this immunity and how long it persists and countless other secondary truths of great importance, which have been, and are, being added to the original truth. It was only the hasty assumption of the hasty philanthropist which had to be un-learned. In our own time, too, the amateur sanitarian and the social reformer and even the public health official are impatient of the slow progress of science and, taking the short and easy road which is paved with guesswork theories and unfounded assumptions, and which leadeth to destruction, they hasten to spread error before the people, which will later hamper the health officer as does now the assumption of Jenner as to the duration of vaccinia immunity, or does the theory of air-borne infection. Let us see what our health officers are teaching today. Are we doing any better than our forbears?

The old heresy about the all importance of dirt, any kind of dirt, in the causation of disease, still persists. If the writers for the weekly or monthly bulletin cannot think of anything else they can always fall back on a new sermon on dirt. Of course we all know that all human excretions are potential of danger and everything which contains our excretions or is smeared with our fresh secretions must be avoided. We know, too, that flies breed in certain kinds of dirt. It is doubtless true, too, that whatever in a general way encourages cleanliness tends to discourage those habits which favor infection. To fight all kinds of dirt instead of limiting attacks to dangerous dirt is misleading and futile. You smiled at the ancient Rhode Island essay on the relation of dirty cupboards to intolerable stomach-ache but is it not as bad to print,

DIRT IS D
isgusting
isfiguring
evitalizing
-e-a-d-l-y

"The dirt-rate of a city is a big factor in determining its death-rate."

"A vigorous anti-dirt campaign

would do the city more good than any other kind of an 'anti' campaign of which we are able to conceive—more good morally, physically, healthfully and eventually with respect to its reputation." Another:

"To clean up the city means to clean out disease."

"Indifference about dirt produces high death-rates from preventable disease."

"Conspicuousness for habits of cleanliness means conspicuousness for good health and a low death-rate."

A picture bulletin shows adjoining yards, one shiftless and dirty, the other lovely with flowers, with the mottoes, "Dirt and disease go hand in hand." "Clean up for health's sake."

The public will thus believe that, when the streets are swept, the rubbish removed from the cellar and yard, the garbage cremated instead of dumped, and the spring housecleaning done, the city's death-rate will be lowered. When they find it is not, they will not believe the next issue of the bulletin which tells them that antitoxin cures diphtheria.

A poster shows "Household weapons against dirt and disease," a broom, shovel, rake, scrub brush, wash tub, bath tub and set basin and other things. The legend runs, "The main line of defense against dirt and disease lies in the home." Are we expected to shovel up bacilli and sweep out spirochetes? Will the wash boiler prevent the baby from catching whooping cough or measles? The bath tub is inscribed the "cradle of cleanliness." "Bathe often and give the pores a chance to breathe." Here is either a remarkable use of the English language or a remarkable physiological discovery. It will not be disputed, I think, when I say that there is not a bit of evidence to show that it makes the slightest difference to our health (except for the tonic effect of a cold bath) whether we get into a tub once a day or once in three months. The individual drinking glass, the individual towel, and running water for washing the hands, are necessary to prevent infection, but they found no place in this picture bulletin. May we not safely infer that the artist was not a thinking animal?

A recent bulletin has a picture of a crowded lodging house dormitory with the subscription "A breeding place for germs." Pretty discouraging, is it not, for those of us who have been trying to eradicate the superstition of bygone ages?

Another form of dirt which appeals to the publicity man is dust. Now, there is one kind of dust which is dangerous, that is sharp mineral dust, but that is not dirty dust. It is the dust of the street and the home that is attacked in the monthly bulletin. A cartoon shows the dust of the street falling on fruit, candy and ice-cream and a little boy in the throes of stomach-ache presumably caused by eating thereof. No evidence has yet been adduced to show that disease ever is spread in this way and much has been adduced to show that it is not. But under the influence of this campaign of publicity, some communities, which feel too poor to furnish free antitoxin, are spending money to keep dust off the ice-cream and bananas. An other bulletin says, "Avoid home dust." It "often causes disease." The fact is that there is so little evidence that street dust and house dust, except perhaps near careless consumptives, is dangerous, that the less we say about the matter the better.

So, too, in the present state of our knowledge of the relation of the air to disease, knowing that the old theory of exhaled poisons has been demolished, that germs rarely float in the air, that we are still in profound ignorance as to the relation of humidity to disease, that most of the supposed effects of foul unventilated rooms have been shown to be due to temperature and odors, is it not better, when our best students of the subject have little to offer but surmises, to refrain from such teaching as,

"Ventilate, you Lobster! Ventilate!"

"Pure air is the best life insurance."

"Get good air and you will get good health."

Another says,

"No one would think of drinking water that had been used for bathing purposes, but many of them go on breathing over and over again air that has been breathed by themselves and other people; air that is literally saturated with the effete products of respiration, emanations from the skin and filth carried on clothing and in foul mouths."

"People have been educated to refuse to eat from tableware that has not been properly cleansed, but offer no objection to a second-hand atmosphere for breathing purposes."

"They will keep their skin clean with soap and water and then pollute their respiratory tract with a polluted atmosphere."

"Many of these deaths are closely akin to suicide; many others are closely akin to murder. How much longer shall the slaughter go on? Radical changes have been made in the street cars and some of the theatres. Much remains to be done."

"Some of the hotel banquet halls are incubators for grippe, pneumonia and consumption."

All of this is absolutely misleading.

A cartoon shows "Blithesome Mrs. Foul-Air and her Deadly Offspring—several cheerful skeletons labeled "Tuberculosis, Pneumonia, Influenza, Bronchitis, and Colds" and another editor names la grippe, sore throat, catarrh, colds, bronchitis, pneumonia and tuberculosis as due to lack of ventilation. "You can't see," he says, "the insidious enemy that lurks in the fetid atmosphere."

"Not even contaminated water is more dangerous to the human system than the air that is breathed over and over until its life-sustaining properties have been replaced by foul poisons given off by the human system."

While some men are striving to learn the truth, and solve by scientific methods the difficult problems of disease causation, the publicity man, as blithesome as mistress "Foul-Air," spreads broadcast pestilential errors which date back a half a century or more.

While we feel quite certain that the pneumococcus is the chief causative agent of pneumonia, pathologists and epidemiologists are still uncertain as to the relation of all the causative factors. The carrier, partial immunity, auto-infection, contagion predisposing causes, routes of infection, strains of varying virulence, offer countless problems still unsolved. No one knows just how pneumonia is caused—except the publicity man. He says,

"Pneumonia is a dirty house disease; it is developed in illy-ventilated houses, not in the pure air of out-doors as many people believe. You can't contract pneumonia in pure air; you can very easily contract it in impure air."

Another,

"Be careless about the air you breathe and you stand a good chance of being numbered among the 3,000 citizens who, in all likelihood, will fill pneumonia graves within the next five months."

Still another,

"From now until about the middle of April the pneumococcus will get in its deadly work. It flourishes in bad air, whether in workshop, factory, store, school room, home, or street car. The air of a closed house is foul, stagnant and disease breeding."

Again,

"One of the prominent men of the country died several weeks ago of pneumonia. A day or two before his illness developed he attended a banquet, and was exposed to an overheated, close, polluted atmosphere. Two prominent citizens attended the same banquet and were made ill, but escaped pneumonia. One was 'laid up' for ten days, the other for two weeks."

Our food, by the popular writer, has always been considered a source of great danger, and to attack adulterations is to receive the plaudits of the multitude. A city which boasts of having recently put its health department on a scientific basis publishes:

"Pure food is as important to health as pure air. The authorities, to whom is committed the duty of protecting public health, have a serious responsibility to discharge at this point. They must rigidly enforce the laws against the sale and offering for sale of decayed and decaying food products, without fear or favor. This we propose to do, but we are charged with destroying some food that is salable at cheap prices. Cheap food may be, and often is, the most expensive food to buy. The poor must be protected against so-called cheap food, which may be partially decayed and dangerous to health. It never pays to run any risk in the food supply of a city. Our slogan is—"Pure food for ———.""

A cartoon shows death pouring adulterants into soups and sardines while a lovely red cross nurse, labeled "health," is dealing out cans marked P-U-R-E. The truth is that adulteration, except in a few instances, is an economic, not a health problem. As to partially decayed foods we know nothing about their relation to health. While inspection may be demanded on esthetic grounds there is no evidence to show that inspection prevents disease. The clean handling of foods is most desirable from a sanitary standpoint but real cleanliness is most difficult of attainment. Much that appears is carelessly written and the emphasis is placed on the wrong thing, as when dust absorbs all the attention and nothing is said about dirty hands. Exaggeration has its way as when we are told that "Dirty ice-cream is a big factor in summer diseases." It is safe to say that the writer neither knows nor cares whether this is true or not.

Some remarkable physiological principles are at times published.

"Lost—One perfectly good pair of kidneys somewhere between Comfort Street and Affluence Boulevard stations on the Road to Wealth. Will gladly pay all my millions for their return.—Mr. I. M. Sorry-Now, 13 Experience Place."

Is it not a comfort to know that the etiology of chronic nephritis has been so well worked out?

Here, too, is news about immunity. If true we may as well give up our vaccine laboratories.

"When we lead a healthy normal life, breathing good air, exercising enough to make a keen blood circulation, eliminating properly and eating our food with a zest, we are at a high point of immunity. Then it is that certain substances within the body make charges against the poisons or toxins and also kill the germs that are responsible for the toxins."

While I have questioned some of the allegations which have been made against the house-fly as a bearer of disease, I am perfectly willing to admit that he does at times and in places become a factor of importance in the spread of fecal-borne diseases. He is also a very dirty and disgusting insect. This is enough. Why call the fly "deadlier than the tiger or cobra" or "the most dangerous animal in the world." It is news to most of us that "Napoleon could not retain his hold on Egypt because of the fly," and "that many diseases of obscure origin doubtless were caused by fly contamination." The same bulletin says that,

"An eminent medical authority has recently figured out that the fly as a carrier of the germs of typhoid fever annually costs the people of the United States for sickness, medical expenses, lost time and funeral expenses the enormous sum of three hundred and fifty millions of dollars!"

We ought to make this accurate mathematical gentleman chairman of our section on vital statistics.

The following, while interesting reading, is somewhat misleading in its etiology.

The Fly.

"He has his birth in the manure, crawls forth and loiters in the sewer, and, smeared with deadly typhoid germs, he leaves his brother maggot-worms, unfurls his dainty wings of silk and dumps his microbes in the milk, where their huge numbers mount and mount, increasing the bacterial count, until they reach the food supply some woman feeds her 'baby-bye.' The fly comes gaily unto us, his feet all gummed with poison-pus, and, singing clear his song so sweet, alights and cleans them on the meat. He gathers scarlet fever spores and leaves them on the walls and floors: he is not proud, and oft will stoop to carry heavy loads of croup, and place it where its awful death may come and go with baby's breath. Oh, do not call him indolent! He calls that summer day misspent in which he fails to load the breeze with the live germs of some disease; and if he finds them not, though hurt, he'll be content with just plain dirt."

We would all like to get rid of the fly but do we really know any practical way of doing it? Is there a flyless city? The bulletins are free with advice, but how good is it? One cartoon purporting to show "How typhoid flies are made" gives mutton chops as their only breeding place. The chief emphasis is usually laid on swatting the fly. This must be practised on the hibernating insect. To kill one is to kill 350,000,000. Prizes for dead flies, fly traps, poison, and all sorts of schemes for handling stable manure are taught us over and over again in infinite variety. Why not wait until some one finds out whether they will work before telling the people that they will work.

One great trouble with the publicity man is an inordinate desire to get in on the ground floor. When he hears something new he tells it without waiting to learn whether it is true. Untried schemes of all kinds are put forward as confidently as if they were as sure as vaccination. It is not so very long ago that the sanatorium was preached as the most important factor in fighting tuberculosis while now many specialists think quite otherwise. Many prophesied the speedy eradication of the disease and not a few fixed the year as 1915. Great speed will be required to finish the last lap. Let us take warning and ever bear in mind that only an exact science can forecast the future. Within a few years various plans of excreta disposal for the rural districts have been published in health bulletins as solving the problem. The editors could not wait to try them. Now they have all proved disappointing and of far from general application. I was recently shown a scheme for the disposal of house drainage about to be published by a state board of health, and when I asked if it had proved satisfactory was told that it had not as yet been tried. Better be the last city to publish a useful sanitary measure than be the first to teach one that later proves a failure.

Many other remarkable things about disease we learn from the weekly bulletins. Thus we read,

"One of our school teachers whose little brothers had died of croup contracted from wet feet some years before, very carefully inspected the little tots in her room for wet feet and found quite a number."

We have plenty of arguments for preserving the teeth without making such a statement as "The use of alcohol to excess does not cause as much disease as neglected teeth." The prohibitionists might well demand the proof.

One bulletin unique in its scientific accuracy yet makes the slip that,

"Every cold in the head . . . comes from a transfer of excreta." Unfortunately we know very little about the group of afflictions called colds and I am not aware that a single type has been definitely proved to be caused by a specific bacterium. On the other hand we do know that one important kind is produced by the pollen of plants and is not contagious.

Probably there are few here who agree with me entirely as to the value of terminal disinfection, but I am sure there are fewer still who would assent to the following recent publication.

"Properly and efficiently done, fumigation is a great factor in the prevention of contagious diseases. It is the only means of checking its spread. A number of cities have spent thousands of dollars to stamp out epidemics in this manner. In fact, it is the only way in which this can be accomplished."

Another bulletin, after recommending the burning of a pound of sulphur in each room at spring housecleaning time, says this is, "a simple method of home disinfection that is most thorough and far-reaching in its results as regards disease prevention." . . .

"This simple method is given in the belief that every housekeeper will use it to the extent that all sleeping apartments, closets where clothes are kept, and such other rooms as required fumigation at house cleaning time will be fumigated in this manner to prevent contagious and infectious diseases from entering the home."

Doubtless there are some who will think all this hypercriticism. The slips are small, they say, and seldom occur. It is true that one may scour many pages of some publications without finding anything to offend, but others show them in nearly every issue. Some, perhaps, are of little moment but who would be so rash as to say that because a lie is a little one it can do no harm. As no one can follow the flight of an arrow, so the poet tells us, or know into whose heart the spoken word shall sink, so no one knows whose mind will be confused by the error which carelessly flows from our pens. One cannot expect scientific accuracy in publicity, a very good friend, who is a forceful writer of telling articles, said to me. I made no decided answer then, but the more I think of it, the more decided I am, that scientific accuracy should be insisted on. Our science itself is so inexact that we cannot afford to swerve one hair's breadth from it. One can hold steadfast to scientific truth and yet avoid, absolutely, all pedantry and scientific jargon. Clear, forceful and catchy writing is worse than useless if it fails to teach the truth and the truth only. So far as it departs from this our health literature approaches that of the fake medicine factory—and perhaps does more harm. The space writer is the curse of our day and generation and especially in our business.

For the sake of those who come after, stop filling your columns with tommy-rot, hot air and dope. Do not be always seeking novelty. Most that is new is bad. There are plenty of old truths which all of our 100,000,000 people have not yet learned. If you have nothing to write do not write it. Remember that bulletins were made for man and not man for bulletins.

Better pay your publicity man for doing nothing than for writing something which is not so. Careless writing betokens the lazy writer. Seek diligently the truth and faithfully publish it.

JUDICIAL ENFORCEMENT OF HEALTH PROTECTION.

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ONE whose position has brought him into close relationship with both the legal and medical professions for many years recently wrote: "The legal point of view is sometimes hard for physicians to attain, and by not doing so they frequently injure their case." This is well illustrated by the following incident.

Soon after the publication of my "Legal Principles of Public Health Administration" I was calling in the laboratory of a food chemist who has had considerable experience. He remarked: "It is disheartening to see how, after the most careful work on our part, cases are knocked out in the court on little unimportant technicalities." He was at that time testing some meat for chemical preservatives. He told me that he expected to prosecute the dealer. Note the extreme weakness of his case, which he thought strong because he found so much of the chemical. He was "too smart to put the market man on his guard by buying the Hamburger himself." He sent a boy in. He employed for this purpose a boy twelve years old, though the state law absolutely prohibited the employment of boys under fourteen. When the boy brought out a package from a store the official took it and marked it, but the boy could not identify the package later. He had no part in marking it, and the package was not sealed. At the laboratory a portion from each package was taken for test, and the remainder, instead of being sealed and preserved as evidence, was thrown away. At the best, here was a one-man chain of evidence. The market man had promised not to use preservatives. Both he and his clerk would probably swear that they had neither used it themselves nor seen others use it. This would be two against one.

It seems fitting, therefore, that the methods used in health administration should be briefly considered.

CHOICE OF ACTION.

The idea of *nuisance* is at the base of all public health protection. This implies that the thing or condition under consideration tends to work an injury to the community. If it work an injury to the community it must necessarily injure private parties. The object of legal measures is to prevent future injury. This may be accomplished by checking the nuisance before it has actually occurred, or by imposing a penalty for its past operation, and as a warning against future harm. It may be checked by injunction. A board of health is not obliged to wait until a nuisance has actually occurred before enjoining the location of a livery stable.[1] In fact, the fact of establishment might be an obstruction against future abatement.

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[1] *Board of Health* v. *Tupper*, 96 N. E. 1096; 210 Mass. 378.

This application for an injunction may be made by the official guardians of the public weal, or by private individuals who may be injured by the proposed erection or establishment.

Secondly, the community may enforce its demands by civil suit. Many ordinances and statutes provide for the recovery of certain fines from those proven guilty of violating the requirements. The state or city sue for the recovery of the penalty. In such cases the amount to be demanded is fixed by legislation. It is a debt due to the community; and sometimes the violator of the law estimates in a cool business way that he may make money by violating the law, pleading guilty, and paying his fine. In other words, he figures the fine in with the other costs of his transaction.

Thirdly, the community may bring action *en tort* against the offender for all injury to the community as such which has actually been produced. Action *en tort* is limited to actual damage which has already occurred. The maintenance of a fly-breeding manure pit may threaten great danger to the community, though no great injury may actually occur. The public weal demands that the nuisance be abated before harm has resulted. This cannot be accomplished by action *en tort*. This should be attacked through criminal prosecution. On the ground of injury actually done, it may seldom be advisable for the community to bring action *en tort*, for of necessity the injury actually done must fall more heavily upon some individuals than upon others. Each of these individuals has a valid claim against the offending party, and justice demands that he should personally be permitted to recover for damages sustained. Since the whole is greater than any part, it practically follows that damages recovered by the community would include damages of individuals, and the private citizens would therefore practically be estopped from action. Ordinarily this restriction would not apply to cases under the second classification, where the community sues to recover a penalty under the statutory provisions. These cases, though civil in form, are essentially criminal. Therefore, one who has borne in full the criminal penalty cannot show this fact in a civil action, either as a bar, or ordinarily in mitigation of damages.[2] However, in a case where the plaintiff in a civil suit had received a portion of the fine imposed in a criminal action, the presiding judge very properly directed that no more than nominal damages of one farthing should be allowed, and he reprimanded the attorney for undertaking the case.[3]

Fourthly, in a majority of the cases recourse is had to criminal prosecution either under the provisions of general statutes, municipal ordinances, or common law principles.

Criminal prosecution may be begun either by indictment or information, according to local laws, generally by indictment. As a general proposition, an indictment will not lie for an injury to only one or two persons.[4] If a nuisance affects the public generally it is indictable; if only individuals, it is actionable.[5] It is not necessary that the thing complained of has actually worked injury to the entire community, but it must be of such a nature to do so in order to be indictable. It is not sufficient to show that divers citizens have thus been injured.[6] For this reason a thing might be indictable in a crowded community, which would be only actionable in a less densely populated section. Where a nuisance can affect only a few persons, the residents of three houses,[7] for example, it has been held that it is not indictable.[8]

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[2] *Jefferson* v. *Adams*, 4 Harring (Del.) 321; *Wheatley* v. *Thorn*, 23 Miss. 62; *Storey* v. *Hammond*, 4 Ohio, 376; *Wilson* v. *Middleton*, 2 Cal. 54; *Ransom* v. *Christian*, 56 Ga. 351.

[3] *Jacks* v. *Bell*, 3 Car. & P. 316; See also *Puert* v. *Seiler*, 23 Pa. 424.

In the light of the foregoing, considering that flies travel only a few hundred feet ordinarily, and that rats would be easily seen and destroyed in making a long trip in the open, a manure pile which might properly be considered a public nuisance in town, and its owner therefore indictable, would at the most be only a private nuisance and actionable in a more thinly settled section. However, if located near a milk bottling plant, where it would endanger the health of a community, it should be considered public and indictable. So a pond breeding only culex mosquitoes in a northern community might be considered only actionable. If it bred anopheline mosquitoes in the outskirts of a town, or near a much frequented highway, it should be considered public and indictable, especially in the presence of malaria in the community. It is possible that it might be considered as private, and only actionable, if the pond be located in a retired spot to which persons might voluntarily resort, as for picnics.[9]

The fact that the statutes provide criminal remedies will not prevent a board of health, or a health officer, in proper cases, from having recourse to civil proceeding or injunction in order to suppress a public nuisance.[10] It is proper for the officer to enjoin the manufacture of food under such conditions as render its use dangerous to the public.[11] Though abatement of the nuisance is ordinarily the sole object of prosecution or action on the part of the community through its officers, abatement is not necessarily a part of the judgment, nor strictly in punishment.[12] Though a voluntary abatement on the part of the defendant may be properly considered by the judge in determining the sentence, still it may not necessarily lighten the penalty.

The state and a private individual may severally and simultaneously carry on, the one a criminal prosecution, and the other a civil suit, for the same wrong if both have suffered from it.

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[4] *State* v. *Schlottman*, 52 Mo. 164.

[5] Bishop, Crim. Law, 8th ed. 236, citing *Rex* v. *Trafford*, 1 B. & Ad. 874.

[6] *Commonwealth* v. *Smith*, 6 Cush. 80; *Commonwealth* v. *Faris*, 5 Rand. 691.

[7] *Rex* v. *Lloyd* 4, Esp. 200.

[8] *Rex* v. *Hornsey*, 1 Rol. 406; *Moses* v. *State*, 58 Ind. 185; *Phillips* v. *State*, 7 Baxter, 151; Bishop, Crim. Law, 243, 244.

[9] See Bishop, Crim. Law, 244, 1.

[10] *Board of Health* v. *Maginnis Cotton Mills*, 46 La. Ann. 806.

[11] *Board of Health* v. *Susslin*, 132 La. Ann. 569, 61 So. 661.

[12] Bishop, Crim. Law, 8th ed. 1079

With certain exceptions, neither will be affected by this double action.[13]

Sometimes the criminal action by the community bears a very intimate relationship to the civil action by the private party injured. Since the facts of the two cases are essentially identical in certain features, a plea of guilty in an indictment may very properly be produced against the defendant in a civil suit referring to the same act.[14] On the other hand, a plaintiff in a civil suit does not stand on "fair ground" unless he shall have first discharged his public duty by aiding in the prosecution for the public wrong.[15] The citizen owes a duty to the state, and when he comes as a plaintiff in a civil suit he must show that he has performed his duty as a citizen by doing his part towards bringing the defendant to justice. Conversely, the public officer should render such aid as he reasonably may in private suits of this nature. It sometimes happens that the only efficient means for suppressing certain dangers to the health of the community may be through the instrumentality of private suits. A single case in which damages are assessed for conveying infection through articles of food, as of typhoid in milk[16] will do more to improve the sanitary condition of similar establishments than would a great deal of inspection and the issuance of orders. A dairy, a market, or a bakery may be closed, but others similar will be opened, and regulations will be evaded. When, however, the proprietor sees others assessed civil damages (not prosecuted and, as he thinks, persecuted by some overzealous official), it opens his mind to his individual responsibility. Through political influence he may get the enthusiastic official removed, and show perhaps that the prosecution was apparently inspired through personal antagonism; but where the court openly finds him, or his fellow proprietor, to have actually caused injury to his customers, or neighbors, he stands in a very different light in the community. However, the public officer should use great discretion in encouraging such prosecutions, and unless the guilt be very clear the action should not be favored. On the other hand, when the private individual actually brings suit the officer should render such aid in the line of evidence as may be within his control. The officer is the servant of the community, and as such he is the servant of the individual.

The violation of a statute or legal ordinance is *prima facie* evidence of negligence, and when that act in violation of the law has a direct relationship to the injury of which complaint is made, this evidence of negligence has an important bearing.[17]

When a statute, ordinance or regulation enters into the consideration of a case, the party invoking its aid must be prepared to show that it is in fact law, and that it bears upon the point in question. When it is a municipal ordinance, or an executive regulation, if the question be raised it must be shown that the city, the officer, or the board, had authority to issue such an ordinance, regulation or order.[18] Overlooking this point is one of the great sources of failure in public health work. When a board of health seeks to enforce its rules and regulations, it puts in issue, at the election of the defendant, their validity and reasonableness, and if the defendant in any given case chooses to accept the issue thus tendered he has an undoubted right to do so, and to have the matter determined by the court.[19]

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[13] Bishop, Crim. Law, 264, citing, False Affidavits, 12 Co. 128; *Blasingame* v. *Glaves*, 6 B. Mon. 38; *Harison* v. *Chiles*, 3 Litt, 194; *Wheatley* v. *Thorn*, 23 Miss. 62; *Kennedy* v. *McArthur*, 5 Ala. 151; *U. S. Express Co.* v. *Jenkins*, 64 Wis. 542; *People* v. *Waterbury*, 44 Hun. 493; *Clark* v. *Peckham*, 10 R. I. 35; *Drake* v. *Lowell*, 13 Met 292; *Corley* v. *Lancaster*, 81 Ky. 171; *Thayer* v. *Boyle*, 30 Me. 475.

[14] Greenleaf, Evidence (16th ed.) 527a; Bishop, Crim. Law, 977 (2); *Fontaine* v. *Moreau*, 11 Q. B. 1028.

[15] Bishop, Crim. Law, 267.

[16] *Frost* v. *Aylesbury Dairy Co.*, 74 L. J. K. B. 386.

[17] *U. S. Brewing Co.* v. *Stoltenberg*, 211 Ill. 531, 71 N. E. 1081; *Channon* v. *Hahn*, 189 Ill. 28; *Hayes* v. *Michigan Cent. R. R. Co.*, 111 U. S. 228.

Sanitary enactments are, generally speaking, of three kinds: (1) Things are ordered done, such as the reporting to the proper authorities when a case of infectious disease is discovered. (2) Acts or conditions are prohibited, such as the discharge of sewage into water courses used for public supply. (3) Standards are fixed by enactment, as for the purity of foods and drugs. Violation of any of these enactments subjects the offender to a liability of punishment under the criminal law. This punishment, with certain exceptions, is not in compensation for a wrong done, or injury inflicted. It is intended more particularly to prevent future harm. The criminal prosecution must be dependent upon some act of negligence already existent, though the actual harm may not have occurred. Criminal prosecution may therefore be possible and proper when civil suit would find no ground on which to stand.

That is not a crime which is not prohibited by law. It is not a crime to sell milk containing less than three per cent. of butter fat unless that minimum be fixed by some form of enactment, though possibly under certain conditions the buyer might sometimes have a right of civil action against the seller. Though criminality presupposes that the act or condition has been prohibited by law, it is not necessary that it be prohibited by enactment. It may be prohibited by either statutory or by common law. Without statutory enactment it would be considered criminal to make a water supply unwholesome, and the offense is indictable at the common law.[20]

It is apparent that the befouling of articles of food might very likely be followed by the illness of those who ate the food. For this reason, even at common law, it is regarded as criminal to thus befoul provisions, meant for use in the community,[21] or to sell such food injurious to the public health.[22] Nor is it even necessary that the articles be actually sold. The mere exposure for sale in the market, or the sending of them to the market for purpose of sale is a complete offense at the common law.[23] It has even been held that the common carrier who knowingly brings articles injurious to the public health to market is indictable.[24] It is well recognized, not only as a matter of general opinion, but also by the courts, that manufactories, which are in themselves entirely harmless, may become nuisances and injurious to the public health when they are located in a thickly populated region.[25] On account of the injury to the public health which noxious trades may occasion, the carrying on such trades in thickly settled communities has been regarded in the common law as a crime.[26]

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[18] Hemenway, Public Health, 90, 95, 96, 100, 102.

[19] *Kineen* v. *Board of Health*, 214 Mass. 587, 102 N. E. 352.

[20] *State* v. *Buckman*, 8 N. H. 203; *Commonwealth* v. *Lyons*, 1 Pa. Law Jour. R. 497; *Stein* v. *State*, 37 Ala. 123.

[21] *Rex* v. *Dixon*, 3 M. & S. 11; 4 Camp. 12; *Rex* v. *Haynes*, 4 M. & S. 214.

[22] *State* v. *Smith*, 3 Hawks, 378; *State* v. *Norton*, 2 Ire. 40; *Rex*. v. *Treeye*, 3 East P. C. 821; *State* v. *Buckman*, 8 N. H. 203; *Hunter* v. *State*, 1 Head, 160; *People* v. *Parker*, 38 N. Y. 85; *Goodrich* v. *People*, 3 Parker Cr 622.

EVIDENCE.

A man who dams a stream may thereby cause flooding of his neighbor's property. Whether or not that flooding may cause damage to the neighbor, and, if so, how much as measured in money, may be very largely a matter of opinion. In a suit for damages the decision is practically a compromise between the opposing opinions. If, however, the damming of the stream has been forbidden by law, the act of so erecting a dam would be a crime, and in the prosecution of the person accused the question is one of fact, not of opinion—Did he, or did he not, commit the act complained of? Therefore, in a criminal trial it is presumed that the party charged with committing the crime is innocent until he shall have been shown to be guilty, for most persons do not intentionally violate law, and it is presumed that before he committed the act he has considered and found the act to be lawful. The "burden of proof" rests upon the party making an affirmation or charge, and in the criminal case it must be "proven beyond reasonable doubt" that the defendant is in fact guilty.[27] This means, not that the judge or jury believe the defendant guilty, *but that the evidence so proves.* In civil cases, on the other hand, the decision is reached by "preponderance of evidence" (over-weight of evidence). There is, then, sometimes a very great difference between the evidence required in a civil and a criminal case referring to the same act; the same evidence may meet with very different results in the two cases.

The "burden of proof" rests upon the party making the affirmation. Ordinarily in a criminal trial this means the prosecution, but when the accused claims the existence of a license, or permission under a license, he makes an affirmation, and the burden rests upon him, the party of defense, to produce the license.[28] This seems to be the only reasonable way in which to consider the subject. It is a practical impossibility often for the prosecution to prove that a man has no license, or that his license does not permit certain acts, unless the license (which he claims to be in his own possession) shall be required produced in court. The license may have been issued but not recorded, or other questions may involve doubt as to fact. However, it has sometimes been held that the burden of proof still rests with the prosecution.[29] Ordinarily, it is held that the one claiming a license must show that he has a genuine license, and that means that he must produce the license itself. A certificate that one is licensed is not sufficient;[30] neither is parol license sufficient.[31]

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[23] *Reg.* v. *Stevenson*, 3 Fost. & F. 106.

[24] *Reg.* v. *Jarvis*, 3 Fost. & F. 108. A similar line of reasoning was shown in an American civil case, where a railroad was sued for damages for the death of a cow from an infection received from infected cattle which the road was transporting to market, and which had temporarily been freed in the community by the wrecking of the car in which they were being transported. *Grimes* v. *Eddy*, 126 Mo. 168, 28 S. W. 756.

[25] *Meeker* v. *VanRensselear*, 25 Wend. 397.

[26] *Rex* v. *Davey*, 3 Esp. 217; *Moses* v. *State*, 58 Ind. 185.

[27] Greenleaf, Evidence, 14 w, x, y, and 81 c.

[28] Greenleaf, Evidence, 79; Wharton, Crim. Law, 2434; *Potter* v. *Deyo*, 19 Wend. 361; *Smith* v. *Joyce*, 12 Barb. 21; *Pendergast* v. *Peru*, 20 Ill. 51; *Great Western R. R. Co.* v. *Bacon*, 30 Ill. 347; *Gering* v. *State*, 1 McCord, 573; *Sheldon* v. *Clark*, 1 Johns, 513; *U. S.* v. *Hayward*, 2 Gall. 485. *Haskill* v. *Commonwealth*, 3 B. Mon. 342; *Wheat* v. *State*, 6 Wis. 455.

A certificate that a man is licensed will not be accepted by the court because it is not "best evidence." "Best evidence" does not mean most evidence,[32] nor does it have reference to the relative value of the testimony of different witnesses, each having an equal chance to know the fact. The person issuing a certificate that a man has a license may be mistaken. The license may have been revoked; it may be forged; it may have expired; it may not cover the point claimed. If the license actually exists, and is valid, there should be no reason for withholding it from examination. It is the court, not some person writing a certificate, who should pass upon the genuineness of the document, and therefore "best evidence" demands the presentation of the license itself in court.

"The true question, therefore, in trials of fact, is not whether it is possible that the testimony may be false, but whether there is sufficient probability of its truth; that is, whether the facts are shown by competent and satisfactory evidence."[33]

We find, therefore, three classes of evidence. (1) Direct evidence—the testimony of those who speak from positive personal knowledge. (2) Circumstantial evidence—testimony relative to other facts, from which the fact in question may be satisfactorily proven. (3) "Autoptic proference," as it is called by Dean Wigmore[34]—that is, the thing itself, is presented to the court for inspection. If the question be raised whether a shoe be with buttons or laced, evidently the exhibition of the shoe would settle all dispute but a witness may be honestly mistaken. "Inspection is like an admission, in that while it is not testimony, it is an instrument for dispensing with testimony."[35]

In public health work autoptic proference may be a very valuable aid in prosecutions, and it is probably too frequently neglected. A sample of goods may be shown to demonstrate its quality,[36] but care should be exercised to see that it is a fair sample. It has been permitted to show the effects of injurious substances.[37] But it is not proper to have a jury test a sample of liquor alleged to be intoxicating;[38] neither was it considered proper to kill dogs or rabbits before the jury to show them the effect of strychnia poisoning.[39] This might be forbidden because it was unnecessary, and because it is not necessarily conclusive. It must be remembered that the same chemical or bacterial infection may have a very different effect on one animal from that shown by another. The fact of the presence of a germ may be shown, though the effects may be different from those in the human body. One way to demonstrate the presence of the tubercle bacillus in milk is by injecting some of the milk into healthy guinea-pigs. After a few weeks, if the pig lives, it is then killed, and after it is dead the conditions are carefully noted. This takes time. In such cases photographs taken before the injection, after the development of symptoms, and of the *post mortem* examination, should be good evidence supporting the testimony of the witness. Occasionally the production of the thing in court, or the performance of a demonstrative experiment, may not be of use to the jury because of their lack of technical education. In such cases often all legitimate objection could be removed by explanations made by experts.[40] Such explanation and demonstration may be much clearer to the jury than would the simple testimony. Suppose that the claim be made that a certain article of food, meat for example, has been adulterated by the addition of a chemical preservative. The testimony of the chemist may be to the effect that he found the poisonous substance present and that the sample of food did keep from decay longer than another known to be free from the preservative. His testimony, however, would have much more force if he presented the two samples, sealed in glass receptacles, and kept under the same conditions, if that which he knew was pure showed more deterioration than the other. If in addition, having previously explained what the apparent results of a chemical test would be, he should make the test before the jury, the force of his testimony would be still more weighty.

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[29] *State* v. *Evans*, 5 Jones, 250; *Mehan* v. *State*, 7 Wis. 670.

[30] *Commonwealth* v. *Spring*, 19 Pick. 396.

[31] *Lawrence* v. *Gracy*, 11 John. 179; *State* v. *Moore*, 14 N. H. 451.

[32] Greenleaf, Evidence, 82.

[33] Greenleaf, Evidence, 1.

[34] Greenleaf, Evidence, 13 a.

[35] *Gaunt* v. *State*, 50 N. J. L. 490, 495.

[36] *Thomas Fruit Co.* v. *Start*, 107 Cal. 206.

[37] *Eidt* v. *Cutler*, 127 Mass. 522; *King* v. *Ry. Co*, 72 N. Y. 607.

Ordinarily autoptic proference is presented in the court room, but sometimes it is necessary that the tribunal shall proceed to the point where the object is situated. This is particularly true in the case of many kinds of nuisance. The granting a view is usually held to lie in the discretion of the court.[41] Sometimes the inconvenience of adjourning court for a view may be obviated; as in the case of a fly-breeding manure pile, by bringing into court, in a bottle, some of the maggots. The owner of the pile may present evidence that he has cleaned his pit every week, when in fact he has emptied it, but not cleaned it, and the maggots would be evidence thereof.

Objection has been raised to all admission of autoptic proference on the ground that it is not in a form for presentation in cases of appeal. We are told, however, that this doctrine has been repudiated by all the courts whose attention has been called to it.[42]

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[38] *Commonwealth* v. *Brelsford*, 161 Mass. 61; *Wadsworth* v. *Dunnam*, (Ala.) 23 S. 699.

[39] *Rex* v. *Palmer*, Annual Register, 1856, pp. 422, 473, 475

[40] Greenleaf, Evidence, 13 h.

[41] Greenleaf, Evidence, 13 b, 13 h.

"It may be mentioned in this place, that though papers and other subjects of evidence may have been illegally taken from the possession of the party against whom they are offered, or otherwise unlawfully obtained, this is no valid objection to their admissibility if they are pertinent to the issue. The court will not take notice how they were obtained, whether lawfully or unlawfully, nor will it form an issue to determine the question."[43] As a rule, when a person induces another to commit a crime he thereby becomes accessory, and as a witness in the case this must be considered, and his evidence weighed accordingly. But when an officer, or even a private citizen desirous of enforcing the laws, believes from general information that the party is breaking the law, he has the legal and moral right to send decoy letters.[44] The fact of the evidence having been unlawfully obtained may very properly be the straw of weight which may influence the court in a doubtful case, especially if the illegality of the obtaining be an unnecessary violation of the law. On the other hand, the very illegality may be necessitated in obtaining evidence. For example: Where there is a law against employing a boy under fourteen years of age there would be no reasonable excuse for so employing a boy of twelve to purchase ordinary articles of food to see if preservatives were used. There would be a practical necessity to employ such a boy to purchase cigarettes, to prepare for the prosecution of a dealer violating a law prohibiting the sale of such articles to boys under fourteen years of age.

It is logic, not the law, which furnishes the test of the relevancy of evidence.[45] The court must be guided by reason in determining whether or not certain evidence shall be admitted; and since the courts are presided over by men it follows that errors may sometimes be made on either side. Nothing should be put into the case unless it have a distinct bearing. Cases are confused, and justice impeded by a mass of impertinent evidence. On the other hand, even high courts may be misled as to the necessity for evidence, and in this matter caution must be observed in following former decisions. With scientific advances legal changes must keep pace. This is well illustrated in a series of cases, particularly referring to the Texas cattle fever. The Missouri Supreme Court held in *Bradford* v. *Floyd*[46] that the defendant could be held liable for damages caused by disease communicated from his cattle to those of the plaintiff, *but that it must be shown that he knew that his cattle were diseased.* This ruling seems reasonable and just, and is in harmony with other cases.[47] Later the Missouri court held that it was not necessary to show such prior knowledge, in a case where a railroad, transporting cattle from Texas to the Chicago market, was sued for the death of a cow said to have been caused by infection received from these Texas cattle.[48] In the course of his opinion Mr. Justice Burgess said for the court:

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[42] Greenleaf, Evidence, 13 j.

[43] Greenleaf, Evidence, 254; *Commonwealth* v. *Dana*, 2 Met. 329; *Legatt* v. *Tollervey*, 14 East, 302; *Jordan* v. *Lewis*, 14 East, 306; *Williams* v. *State*, 100 Ga. 511; *Trask* v. *People*, 151 Ill. 523.

[44] *Ackley* v. *United States*, 200 Fed. 217.

[45] Greenleaf, Evidence, 14 w.

[46] 80 Mo. 207

[47] *Pater* v. *Adams*, 37 Kas. 133; *Railroad* v. *Finley*, 38 Kas. 550.

"While the proof did not show that the cattle were themselves, in fact, diseased, it is of general notoriety that all cattle in that part of Texas from which these cattle were shipped were infected with a microbe or germ of disease which is taken in by Missouri cattle by injection, that is, taken into the system through the stomach by eating grass over which Texas cattle have travelled, or by drinking water from pools or streams through which they have passed and deposited the germ by dropping, or from ticks. . . . It is now a matter of general information or knowledge . . . that all Texas cattle are infected in their system with a parasite or germ, which is harmless to them, but which taken into the stomach by native cattle produces what is known as Texas fever." Though the fact of general infection of Texas cattle was more true twenty years ago than it is today, the statements of the court as to the method by which the disease was spread are now known to be false. The disease is not spread by taking the germ into the stomach. It is spread only through the agency of the tick. After being gorged with infected blood the ticks drop to the ground to lay their eggs, and their infected progeny climb to new animals and infect them. This takes time. Since the court in that case was proceeding under a mistaken hypothesis when it took certain supposed facts as general knowledge, it shows how necessary it is to prove each step. It is true that cattle may be infected with the disease, and able to give it to others through the agency of the tick, although they may not show any symptoms of disease—they may be immune to the influence of the germ. Justice therefore seems to require that the plaintiff in such a case show either that some of the cattle were sick with the disease; or that their blood contained the suspicious germs; or at least that they were infested with ticks. He should also show that some one of these facts were within the knowledge of the defendant. As to the fact of infection of those specific cattle it might be very difficult for the plaintiff to get any evidence, because of the removal of the cattle to the market. He should at least show that within the knowledge of the defendant that infection was common in the vicinity from which the cattle came. He should further show (a) the presence of the disease germ in the body or blood of the secondary, or local cow; or (b) the presence of ticks upon her body, with symptoms of the disease; and (c) that there was no other discoverable source of infection; and (d) that the symptoms appeared at the end of the ordinary period between the dropping of a tick and the infection through the newly hatched ticks.

Similarly, in proving the transmission of disease through milk, as in the English case,[49] dependence must be had upon circumstantial evidence. Here it was shown (a) that there was upon the dairy farm, or connected with the handling of the milk, a previous case of typhoid fever. (b) That the percentage of persons using that particular milk who had typhoid fever after this primary case was greater than among the users of other milk. (c) That the proportion of cases of infection was greater in the families using that particular milk among those who especially used the raw milk (children) than among the others. (d) That there was no other discoverable common relationship peculiar to those infected. (e) If in addition colon bacilli be found in the milk it shows fecal infection to a criminal degree, and if the specific bacillus of typhoid be surely isolated from the milk the evidence should satisfy any reasoning person.

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[48] *Grimes* v. *Eddy*, 126 Mo. 168, 28 S. W. 756.

[49] *Frost* v. *Aylesbury Dairy Co.*, 74 L. J. K. B. 386.

The health official must remember that it is a very different thing to prepare successfully to prosecute violators of sanitary regulations, than mere informatory examinations. In routine work he may neglect the duplication of witnesses, sealing of packages, and the preservation of remnants of samples. He may thus get information which will be sufficient for his routine work. Often moral suasion is better than criminal prosecution. It gives the culprit a feeling that he is being favored in a friendly way, and stimulates him to return the favor by obeying the requirements; whereas threats and prosecutions arouse retaliatory opposition. No prosecution should be carelessly begun. That is persecution. Little points should all be considered. It is not enough that the health officer is satisfied that the law has been broken, nor that the judge should believe the man charged was the violator. The *evidence must show* that the law was broken, wherein it was broken, and that the party charged was the guilty party. A physician was charged with having prescribed or administered medicine illegally, and the conviction was set aside because the evidence in the record failed to show that he had given any drug or medicine known in materia medica.[50] The testimony of a physician that before he would assume care of a case of miscarriage he insisted and secured from the woman a statement that another physician had given her some medicine "to bring her around," and supported by the presentation of the writing, is not sufficient to prove that the physician so accused did actually attempt to kill the life of a child in utero.[51] Under the best evidence rule, if the woman were living her written statement should not have been admitted, and at best the physician's statement could only be confirmatory evidence, dependent upon direct evidence of the participation and intent of the physician charged. If the statement of a woman be taken under such conditions it must be shown that she made the statement in view of impending death, and as her last statement. This should be embodied in the written document, and if possible it should be sworn to before a proper officer. It should also be proved in case of question, that when the statement was made it was with a full understanding of all that it implied.

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[50] *Allen v. State*, Oka., 138 Pac. 178

[51] *Board of Medical Examiners v Eisen*, Ore., 123 Pac. 52.

The chain of evidence should be complete, from beginning to end, and it should be presented in such order that the relationship of one fact to another may be apparent. To guard against mischance it is better, where conveniently possible, to have a double link chain. For example: In a case where a sausage dealer is accused of putting a chemical preservative in his meat, it is very likely that both he and his clerk will swear that neither did himself put such preservative in, and that he did not see the other do so, and that no other person was employed about the place. This is a double link covering every point. Where a single officer said that he bought such meat and found the preservative it would be one man's word against two. If the officer sent some one else to buy the meat, and after receiving it he took it to the chemist and left it for examination, though each should testify, it would be only a one man chain of evidence, leaving it at any point one man's evidence against two.

The evidence must be carefully prepared, and the prosecutor must know before the trial begins that he has covered every point, and that his evidence is all present. After the jury has been sworn, the fact that evidence is defective so that the trial cannot proceed, as on account of the absence of important witnesses, does not permit or give another trial of the accused for that offense.[52] This is in accord with the provisions of the fifth amendment to the national constitution, which also prohibits the forcing of a person accused of crime to testify against himself. This does not, however, interfere with the right of the accused to give evidence in his own defense.[53]

Penalty Imposed.

Most criminal prosecutions for violations of sanitary laws and regulations are under special legislative acts. These enactments generally provide certain penalties for the punishment of violators. The ordinary provisions are either fine or imprisonment or both. These are also the ordinary punishments imposed under the common law, and when the statutes do not provide specifically for the punishment, the common law provisions rule, and the penalty is either fine or imprisonment, or both.[54] Where the statute says "fine *and* imprisonment," both must be imposed.[55] When the statute says simply fine *or* imprisonment, only one of them may be inflicted.[56]

The object of the punishment in sanitary prosecutions is simply the prevention of further danger in most instances, and the penalty should be selected for that object chiefly. The fine may have this result, and the fines collected may materially help in the expense of conducting the supervision and prosecution. There are, however, two very grave objections to the collection of fines without imprisonment. They are often used in certain blackmailing operations. This is especially easy where the pay of an officer depends upon fees. Unscrupulous political officers start prosecutions, or threaten them, and then stop or dismiss the cases on the acknowledgment of wrong on the part of the accused, and the payment a portion of a portion of the maximum penalty. This payment goes into the pocket of the blackmailing official, and lack of compulsory publication enables him to keep the transaction quiet. Because of the knowledge of this form of abuse, honest officials are frequently suspected of a like motive. Even officials who are legally honest, when paid portions of the fines collected, may show zeal in proportion to their possible receipts, rather than to the needs of the community.

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[52] Bishop, Crim. Law, 1037 (2).

[53] Greenleaf, Evidence, 374; Bishop, Crim. Law, 973.

[54] Bishop, Crim. Law, 940, citing, *Cornelison* v. *Commonwealth*, 84 Ky. 583; *Conner* v. *Commonwealth*, 13 Bush. 714; *Syracuse, etc. Plank Road* v. *People*, 66 Barb. 25; *Atchison* v. *State*, 13 Lea, 275.

[55] *Scott* v. *Chambers*, 62 Mich. 532.

[56] *U. S.* v. *Vickery*, 1 Har. & J. 427.

Secondly, the payment of fines sometimes gives to the culprit the feeling that he is paying for the privilege of breaking the law, and that therefore he may break it as often as he is willing to pay; and the payments may be less than his profits derived from the business of breaking the law. His profits from selling oleomargerine colored to resemble butter may be a hundred dollars a day. Fines aggregating on an average fifty dollars a day would leave him a net profit of fifty dollars a day. It is practically impossible to successfully prosecute more than a very small proportion of these violations, and the fines imposed are not therefore proportional to the violations. So long as his personal liberty is unrestricted such a man might feel free to pay and break the law. The disgrace and inconvenience of confinement is another thing. It seems reasonable, therefore, that after at least a second conviction all subsequent punishments should include, if the statute permits it, imprisonment, and that the term of imprisonment be necessarily lengthened for each subsequent conviction, perhaps in geometrical ratio. Further, since it is true that some corporations may be especially prone to undertake this form of "business," statutes should make each stockholder personally liable to imprisonment, and imposing still longer terms of imprisonment upon the officers. Imprisonment of some of the officers of such a corporation should be imperative in all cases in which the corporation have previously been fined for a like offense. At the same time, it is no more than just to the community that with the imprisonment a fine be imposed which will, at least partially, defray the expenses of this line of public service. Sanitary laws should frequently bear the penalty "fine *and* imprisonment."

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THE ROCHESTER MEETING.

Have you forgotten or, perchance, not even heard that the 1915 meeting of the American Public Health Association is to be held at Rochester, New York, September seventh to tenth? It is no platitude in this case to say, "*Everything indicates that this will be the biggest meeting in the history of the Association.*" This time "*There's a reason.*" The New York State Department of Health has called the Annual Conference of Empire State Health Officers at the same time and place and has arranged with Governor Whitman to be present and address the meeting.

New York State has some 1,400 cities, towns and villages with separate health officers. Last year about 800 of them attended the conference at Saratoga and this attendance was in no wise extraordinary or attributable to any unusual cause. With the added attraction of meeting with the American Public Health Association there will be many more than 800 of them at Rochester in September.

Because you will have the chance to meet near a thousand health officers and many laboratory workers, statisticians, sanitary engineers, social workers, industrial hygienists and others, you should make a special effort to come to the meeting this fall, but this is not the only reason. The program that is being arranged is based on both attractiveness and utility and will be sure to appeal to you.

The question involved in the increasing death-rates from the so-called "wear and tear diseases" of middle and later life must soon receive more general attention on the part of health workers. One of the sessions of the General Association will be devoted to the discussion of this topic. The health workers of the country must extend their efforts in this neglected field and must begin preaching with greater emphasis the need for personal hygiene and the health duties that the individual owes to himself. Of the comparatively few men who have thus far demonstrated their recognition of this important problem and their capacity to discuss it, a number of the leaders will be present at Rochester.

Health workers must be primarily educators and secondarily policemen. *Public health education must come first.* One session of the General Association will consist of a symposium on the educational features of public health work. There will be papers by some of the men who have shown themselves most apt in acquiring the successful technique required in this highly important department of public health work. To attain the maximum of usefulness, the health worker must be able to handle publicity and educational work.

Another of the general sessions will be devoted to the "Milk Question" and will be a joint session of the Association with the Laboratory Section. The responsibility of public health authorities for the protection of the milk supply from infection is one of the things which must be emphasized more than has been the case in the past.

The President's Address, by W. T. Sedgwick, Professor of Biology and Public Health at the Massachusetts Institute of Technology, will be worth hearing. Professor Sedgwick is one of the pioneers in public health work and has been training health officers for many years. His message will be an important one.

The chairmen of the program committees of the various sections all report progress and are optimistic that there will be no falling off in the standards of the programs of previous years.

Then there is the important question of the proposed revision of the Constitution and By-Laws of the Association. This is a matter of the greatest significance to the Association and furnishes an added reason why the attendance should be unusually large.

The local committee, headed by Dr. Montgomery E. Leary, President of the New York State Sanitary Officers Association and the committees of the flourishing Rochester Public Health Association and other interested citizens are giving time, money and thought without stint to the work of making your visit to Rochester a pleasant as well as a profitable occasion to you. It is hoped that you will repay their efforts by a large attendance.

The entertainment program will be of the highest order. Special attention is to be paid to the visiting ladies.

A preliminary announcement will be sent you in the course of a few weeks. This will give you the main facts with regard to the hotels, entertainments, places of meeting and program. Be on the lookout for this. Meanwhile make a note in your diary that you are going to be in Rochester, New York, September seventh to tenth.

THE HARRISON ANTI-NARCOTIC ACT.

It is daily becoming better known that opium, its derivatives and cocaine are being used in alarming amounts all over this country. Various factors, such as the careless prescribing of these drugs by physicians, the spread of habit from person to person, the cupidity of druggists and patent medicine manufacturers, and vice and dissipation are responsible for the existing conditions.

It was the hope of those familiar with this vicious traffic that the Harrison Act would save the situation. This act went into effect March 1. It surrounds the importer, manufacturer, wholesale and retail druggists with ample restrictions but it exempts the practising physician. Why? It has been shown repeatedly that the physician is the greatest single factor in drug addict formation,—worse than the patent medicine man, worse than the criminal druggist, worse than dissipation and vice! The Harrison Act; Subdivision A, Section 2, permits the "dispensing or distribution of any of the aforesaid drugs to a patient by a physician, dentist or veterinary surgeon registered under this act in the course of his professional practice"; right here the act fails. Up to the present writing no official interpretation of "in the course of his professional practice only" has been forthcoming from the Department of Internal Revenue. It has been hinted from official quarters that the act has reposed a great trust in the physicians of this country. Meanwhile the prescribing of these drugs to addicts goes merrily on all over the United States!

Not until prescribing by physicians is limited to the treatment of disease or the cure of habit; until free treatment is provided for indigent users and until no "trust" is imposed in any group of men, except those sworn to enforce the law, will prohibitive legislation put an end to the present shameful conditions.

It would appear that the utmost to be hoped from the Harrison Act, in its present mutilated state, is an accumulation of data relating to the extent of drug addictions in this country that may shock the nation into demanding of Congress suitable legislation.

Why Congress should have introduced these weak and indefinite clauses into this important measure and then dumped it on the Department of Internal Revenue to interpret and enforce is not evident to those interested in this momentous question. It can possibly be explained in part by patent medicine money, in part by manufacturers and wholesalers, possibly in part by some misguided members of the medical profession both in and out of Congress. However explained the fact remains that the Harrison Act, as finally enacted, shows every evidence of attempting to evade a proper recognition of the factors underlying this national problem.

C. E. Terry.

THE DAIRYMAN VERSUS THE DAIRY.

DR. CHARLES E. NORTH,
Director North Public Health Bureau, New York.

AS PROGRESS continues in the improvement of milk supplies, the relative values of the several factors which contribute to produce the best results become more clear. The invention of the dairy score card a number of years ago was the first real attempt to define and put a value on the different items in the list of sanitary recommendations. The score card has proved a most useful instrument for educational purposes. On the other hand, it fails in the light of more modern knowledge to give sufficient emphasis to factors of primary importance and to delegate to the background factors of secondary and even insignificant importance.

In an earlier publication* on this subject I pointed out my personal experience of a number of years in the production of certified milk, during which time I was surprised to discover that milk almost equal in sanitary character to the milk produced in my expensive sanitary cow stable could be produced in a very old and dilapidated barn on the same farm merely by the exercise of the simplest sanitary precautions. Bacterial tests for an entire year gave an average in the model sanitary barn of 1,097 bacteria per cc. while the milk produced in the old barn in the same year averaged 3,102 bacteria per cc. This led me to propose the production of clean milk on a large scale in ordinary dairy barns by the institution of similar methods. I first established this system at Homer, N. Y., where in the ordinary barns of seventy-one dairy farmers I produced an average of about 10,000 quarts daily of milk which most of the time contained less than 10,000 bacteria per cc. in a raw state. For a period of four years now this method has been in use under practical business conditions, and continues to be successful through the exercise of the simple sanitary precautions I established which are now controlled by the expert in charge of the laboratory in the central milk station. The details of these methods have been described in previous publications.†

These same principles were again demonstrated two years ago in the shipping station at Sparks, Md., where twenty-eight dairy farmers within six weeks' time reduced the average of their mixed milk from over 2,000,000 to under 40,000 per cc. In like manner at the milk shipping station in Oxford, Pa., during the past fall and winter, eighty-seven dairy farmers have been trained to produce clean milk, and by the same system of control have reduced the bacteria in the mixed milk at that station from an average of several millions to an average under 50,000 bacteria per cc.

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* "A Method of Milk Production," New York Medical Record, February 15, 1908.

† "Sterilizing Stations in Dairy Districts," Journal of the American Public Health Association, September, 1911. "The Production of Sanitary Milk by Our Present Milk Producers," Fifty-ninth Annual Report, State Board of Agriculture, Boston, Mass., 1912.

As a matter of fact the Grade "A" milk on the New York City market which has grown in the past year from a few thousand quarts to over 110,000 quarts daily is produced in the dairy barns of the rank and file of dairy farmers through the adoption of similar methods carried out under the supervision of the large milk companies of New York City. This means that any dairy farmer can at small expense be taught how to produce clean milk.

The object of the present article is to relate the circumstances of a demonstration recently completed, which had as its purpose a comparison of the work of two groups of dairy farmers producing milk at different times in the same dairies. Forty points are allowed in the dairy score card for equipment and sixty points for methods. "Methods," refers largely to the activities of the dairyman himself, while "equipment" obviously relates to the inanimate objects such as barns, milking utensils, etc. From this it seems fair to assume that the score card considers the dairy as having an importance of 40 per cent. and the dairyman an importance of 60 per cent. in securing a clean finished product. After my experiences in Homer, N. Y., and Sparks, Md., I stated that the dairyman should have a value of 75 per cent. and the dairy a value of only 25 per cent. After my experience at Oxford, Pa., I stated that the dairyman has an importance of 90 per cent. and the dairy only 10 per cent. On a number of occasions I have stated that dairy farmers after having been properly trained in sanitary methods could be organized into a company and marched around the country from one dairy district to another and that they could on the day of their arrival in any dairy district produce clean milk. To confirm this statement by actual experiment was the purpose of the demonstration herein described.*

The work was carried out as follows: A bacteriologist was sent to a large milk shipping station at Kelton, Pa., where no effort had previously been made to introduce special sanitary methods or to make bacterial tests of farmers' milk. In short, the station and the dairies and the dairy farmers conformed in every way to the general character of places supplying the bulk of Philadelphia market milk. Without any announcement of his purposes the bacteriologist proceeded to take samples of milk each day for a period of six days from the cans delivered to the station by fifty-four dairy farmers. After the first two days it was possible to know which of the farmers were delivering milk containing the largest numbers of bacteria. These men were selected as best fitted for the purposes of the demonstration proposed and subsequent tests were limited to the milk from the dairies showing the highest counts.

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*This demonstration was made possible by the courtesy of Abbott's Alderney Dairies, a large milk company of Philadelphia, Pa., which placed at my disposal the two shipping stations mentioned and through its representatives made all arrangements for the coöperation of dairy farmers as well as furnishing laboratory facilities for the bacterial tests.

At the same time arrangements were made with the milk company to secure a supply of covered milking pails and forty-quart milk cans, all of which were properly washed, rinsed, sterilized and dried. Application was made to the milk station at Oxford, Pa., for the services of a number of the eighty-seven dairy farmers bringing milk to that station, these men being selected from the list because of the excellent records shown by them for a period of six months in producing milk with small numbers of bacteria. The laboratory tests of the milk of the Oxford farmers were already a matter of record. The last six tests of the milk of ten Oxford men previous to their participation in the demonstration are given in the tabulation below:

BACTERIAL TESTS OXFORD DAIRYMEN'S MILK.

(ON OXFORD DAIRIES.)

March 17 to April 5, Inclusive.

Dairyman.	Test No. 1.	Test No. 2.	Test No. 3.	Test No. 4.	Test No. 5.	Test No. 6.
No. 1	13,000	13,000	21,000	4,000	21,000	20,000
2	7,000	13,000	23,000	4,000	60,000	18,000
3	4,000	19,000	25,000	8,000	24,000	17,000
4	20,000	8,000	21,000	11,000	19,000	23,000
5	15,000	4,000	16,000	7,000	22,000	18,000
6	6,000	20,000	19,000	24,000	22,000	25,000
7	10,000	20,000	26,000	22,000	12,000	11,000
8	21,000	9,000	9,000	15,000	11,000	22,000
9	10,000	22,000	23,000	12,000	21,000	13,000
10	20,000	15,000	24,000	16,000	29,000	80,000

From the above it appears that these ten farmers were consistently producing very clean milk. Their record for the past six months corresponds very closely with the figures given in the above tabulation. The last column represents samples milked on the night of April 4 on Oxford farms.

The afternoon of April 5 was designated as the date for carrying out the demonstration. The ten Oxford men indicated in the above table met me at the Oxford milk station where the purposes of the demonstration were described to them in detail. With myself and assistants they took the train leaving Oxford at 2.08 p. m., which arrived at the milk shipping station at Kelton, where the demonstration was to take place, in less than an hour.

At Kelton we were met not only by the Kelton dairymen who had been selected to participate in the demonstration, but also by the majority of the other dairymen bringing milk to that station. These men had assembled because they desired to learn about the prospects for establishing the Grade "A" milk business with its system of premiums for clean milk.

The demonstration proceeded by pairing off the ten Oxford men with Kelton farmers, who conveyed them in their wagons to their dairy farms. Covered milking pails and milk cans properly washed and sterilized had previously been taken to these farms. The afternoon milking of April 5 was performed on each of these ten farms by the Oxford farmers. Each of these men carried out such detailed precautions as his own personal experience at home had taught him were useful. I was able to visit five of these dairies while the milking was progressing.

Interior of one of the Kelton cow stables where demonstration took place. Milk produced in this stable is shown in the last tabulation of bacterial tests of milk as No. 2 in the list.

The milk produced on these ten farms remained in the cans and was cooled in the usual manner by standing in tanks or tubs of spring water, excepting in one instance. This one exception was the case of an Oxford farmer, No. 1, who packed his forty-quart can of milk in a bank of snow in an effort to excel his competitors.

The Oxford men finished their work in time to take a train leaving the Kelton station at 6.08 p. m. The times of their arrival and departure are noteworthy inasmuch as they show that these dairymen unfamiliar with these dairy farms were on the premises for a period of not more than two hours in all.

The milk produced by the Oxford dairymen remained overnight on the Kelton farms. On the following morning, April 6, the bacteriologist took samples from the cans of milk brought to the Kelton station from these ten farms. The results of all of the analyses of samples taken from these farms previous to the demonstration and on the day of the demonstration appear in the following table:

BACTERIAL TESTS OF MILK PRODUCED ON KELTON DAIRIES.

By Kelton Dairymen.						By Oxford Dairymen.
March 29.	March 30.	April 1.	April 2.	April 3.	April 5.	April 6.
1,200,000	1,160,000	60,000	60,000	57,000	1,830,000	3,300
....	....	950,000	2,800,000	680,000	1,520,000	3,100
570,000	910,000	810,000	380,000	1,000,000	4,830,000	4,600
2,000,000	760,000	3,000,000	1,200,000	940,000	4,000,000	7,000
5,000,000	500,000	1,600,000	1,000,000	....	1,450,000	4,100
290,000	1,100,000	600,000	3,000,000	2,600,000	3,600,000	61,000
1,400,000	....	320,000	....	8,000,000	60,000	800
11,000	9,000	....	....	....	....	2,500
4,000,000	2,100,000	2,200,000	540,000	56,000	70,000	1,600
1,900,000	800,000	380,000	1,600,000	1,110,000	500,000	5,600

The above tabulation shows a remarkable contrast between numbers of bacteria in the milk produced on these ten Kelton farms by the Kelton dairymen and the numbers in the milk produced on these same farms by the Oxford dairymen. To those who have not been through similar experiences, the small numbers of bacteria in the last series of tests may seem unbelievable. These numbers in every case excepting one are even less than those found in most of the tests of milk produced on Oxford farms by the Oxford dairymen. One explanation for this is the fact that pails and cans were sterilized with special care for the demonstration, and in addition to this every Oxford farmer was stimulated to exercise more than usual care because of his desire to excel in this demonstration. In the case of farm No. 6 the Oxford man complained that much dust was raised due to sweeping out of the stable at milking time by the Kelton man.

Such results in ordinary barns are now well recognized as possible not only in my own experiences at the several milk shipping stations mentioned, but also in the experience of the milk dealers producing Grade "A" milk for New York City market and in the reports of many milk laboratories both public and private. In this particular case duplicate samples of milk were sent to an independent laboratory, both of samples taken April 3, previous to the demonstration, and samples taken April 6. The results confirm in every way the results of my own test.

No changes whatever were made in the Kelton dairies. Such items as ventilation of barns, character of the floor, disposal of manure, cleaning of cows, whitewashing of barns, lighting, character of water supply, and numerous other items listed on the score card remained unaltered. The majority of the Kelton dairies had no milk houses whatever, using open tubs or troughs in the yard for cooling purposes. The Oxford men used the Kelton barns as they found them. They were successful mainly because they concentrated attention on factors of primary importance in producing clean milk. They milked with dry hands into sterilized milking pails having mouths only five inches in diameter. They kept their forty-quart milk cans in places sheltered from dust. With one exception they avoided raising a dust during milking time. They refused to use strainers of metallic gauze or of cloth because the same were not properly washed and sterilized. They refused to use stirring rods or dippers in cooling milk. They used no unsanitary coolers or aërators. In every case cooling was done in forty-quart cans by standing them in barrels or tanks.

If one should attempt to eliminate all nonessentials or matters of secondary importance and draw up a statement of the factors which are of primary importance and which even alone are sufficient to produce under the conditions found in ordinary dairies a milk so clean that it will have with great regularity a bacterial count of less than 10,000 bacteria per cc., the list of fundamentals would be as follows:

1. Milking with dry hands into covered milking pails.
2. Proper washing and sterilization of milking pails and milk cans.
3. Cooling milk by placing cans in tanks of cold water or ice water.
4. Regular laboratory testing of milk for bacteria and payments based on laboratory tests.

This last item furnishes the strongest possible stimulation to the milk producer, not only because it supplies constant information concerning the character of the product, but also because the financial inducement to the producer is based on results and not on conditions at the dairy, and consequently the producer bends all efforts to secure results.

In drawing conclusions from the above demonstration it must be noted that the dairies were a common factor to both groups of dairy farmers—the same barns, the same cows, the same surroundings were used by both. The only difference in equipment consisted in the covered milking pails and the proper sterilization of milk pails and milk cans in the case of the

Oxford farmers. These were undoubtedly factors which contributed largely to the successful results, and their value must be duly considered in estimating just how much credit should be given to the care exercised by the Oxford men and to the differences in the character of the utensils used. While the milk cans are sterilized at the central shipping station the covered milking pails are regularly washed and sterilized on the dairy farms themselves, consequently the sterilization of milking pails is a matter for which the dairyman himself is responsible. On several of the farms in this demonstration the Oxford men insisted on scalding out their milk pails and milk cans as a final precaution before going to work. Covered pails can be found on many dairy farms but are on exhibition only as ornaments and are not put into practical use. The use of the covered pail is something that must be credited to the man entirely apart from its presence on the premises. Here again, therefore, the man himself is the primary factor.

I believe the above demonstration justifies the conclusion that the dairyman is the chief factor and the dairy of secondary importance. The clean dairyman may be transported from dairy to dairy and can make clean milk wherever he goes. The thing that is most certain to induce a dairyman to produce clean milk every day is to base his payments on results. The product is the thing and not the score. In securing the product it is the man and not the dairy.

THE ACCURACY OF AMERICAN CANCER MORTALITY STATISTICS.

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Read before the Section of Vital Statistics, American Public Health Association, Jacksonville, Fla., November 30–December 4, 1914.

THE accuracy of cancer mortality statistics depends,

First, upon the final diagnosis of the attending physician who signs the certificate of death;

Second, upon the statistical practice or the methods employed in classification, tabulation and analysis.

Diagnosis, according to one of the recognized authorities on the subject, in its narrower sense, "consists in bestowing a name upon a certain assemblage of pathological phenomena." In a more comprehensive sense of the term, according to the same authority, diagnosis includes "also a knowledge of the causal factors of the disease; a determination of its character with reference to type and severity; an estimate of the amount and kind of damage, both general and local, which has been sustained by the organism; a forecast of the probable course and duration of the morbidity process; and a cognizance of the personal characteristics of the patient, whether psychic or physical, inherited or acquired."*

The primary object of medical diagnosis is the successful treatment of disease for the purpose of cure and the prevention or postponing of death. The assigning or determination of the final cause of death is, and always must be, a secondary consideration in the practice of medicine. The sphere of diagnosis is large, complex and more or less ill-defined The perfect diagnostic method includes a variety of widely different processes, but in the main reliance is placed, according to Butler, upon the clinical diagnosis based upon symptoms of disease manifested during life; differential diagnosis or the process of distinguishing between different diseases which resemble one another more or less closely; and anatomical diagnosis or a knowledge not only of symptoms or phenomena, but also of definite anatomical alterations on which the phenomena depend (this in its general sense constitutes the usual post-mortem diagnosis); pathological diagnosis, which has to do with the nature of a lesion without regard to its situation and the modifications of function and changes in structure caused by disease, and finally, physical diagnosis, which consists of physical (objective) signs irrespective of subjective symptoms and which in part requires the aid of instruments of precision, including the use of the microscope and chemical analysis.

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* Diagnostics of Internal Medicine. Glentworth R. Butler, M.D., D. Appleton and Co., New York, 1905.

This formidable array of methods and processes emphasizes the complexity and variability of the diagnosis of disease before death. The term "disease" does not admit of a precise definition; but a generally accepted one reads that disease may be defined as "a change produced in living things in consequence of which they are no longer in harmony with their environment." Even the term "death" does not admit of a precise definition: for, while according to James Ritchie, the natural termination of life might be looked for when the cells of the body by a gradual process of decay fail to maintain the exchange of material which is characteristic of life, the body "is so complicated that death from such a pure condition of senility occurs but rarely." Even if we confine our view, according to the same authority, to "deaths due to disease, we find in the great majority of cases that death occurs either when the tissues have not reached their full maturity, or while they still possess adult vigor." The difficulties of exact diagnosis are therefore enormously increased by the complexity and ill-defined nature of disease and death which occur under innumerable varieties of conditions and circumstances. Accuracy in medical diagnosis represents in its final analysis that indefinable something called *judgment* which is largely the result of gradually acquired knowledge and experience. The summary result of the numerous diagnostic processes and methods must and always will defy complete analysis and absolute verifiable accuracy.

Deaths in human beings result from a multitude of causes which occur usually in combination to a more or less indeterminable degree. The International Classifications of Causes of Death includes only 189 specific diseases or groups; but this limitation is entirely as a matter of practical convenience. Not only are the direct or specific causes of death much more numerous, but it is rare that death is due absolutely to a single cause. The practice of differential diagnosis or the development of the medical judgment to distinguish between the various diseases in which each individual symptom may be observed constitutes the most involved and perplexing branch of the practice of medicine. The principle has been laid down by French* "that a particular symptom attracts special notice in a given case, and that the diagnosis has to be established by differentiating between the various diseases to which this symptom may be due." There are, however, practical difficulties which preclude the drawing of a precise line of demarcation as regards the symptoms themselves. The domain of medicine is so vast that even the most experienced physician, with a large practice extending over a generation, could not possibly master all the principles of medical diagnosis with absolute certainty and unerring accuracy.

The limitations of the human judgment when applied to the study of mortality problems are still more apparent in the methods of statistical practice, or the recording, classification, tabulation and analysis of deaths.

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*Index of Differential Diagnosis of Main Symptoms by various writers edited by Herbert French, M. A., M. D., Wm. Wood and Co., New York, 1913.

The classification of deaths for statistical purposes is far from having attained to a degree of scientific conclusiveness. The International Classification by single causes leaves the much more complicated classification of joint causes in an unsettled condition. The liability to error in the final assignment of causes of death is therefore quite serious, and likely to remain so for many year's to come. It is only recently that the first official list of joint causes with suggestions for their proper assignment in the international classification of single causes has been published by the Division of Vital Statistics of the Census. Rumsey, some forty years ago, pointed out the numerous fallacies which are inherent in every disease classification. In a recent study of the experience data of the Johns Hopkins Hospital I have fully discussed these difficulties, as best brought out by the Bellevue classification of diseases and its correlation to the International Classification of Causes of Death. If the attending physician would in all cases give a full statement of primary, secondary and possibly additional contributory causes, a material improvement would result in the accuracy and completeness of our vital statistics. Efforts in this direction are constantly being made by the Division of Vital Statistics of the Census, by state and municipal registrars and other agencies interested in mortality problems. An investigation made by the Metropolitan Life Insurance Company has established the fact that in certainly not less than 5 per cent. of the mortality returns a material correction is required to secure a proper determination and assignment of the final cause of death.

In its final analysis the determination as to what constitutes the primary or immediate cause of death must remain largely a matter of judgment more or less subconsciously arrived at by the attending physician. Time and opportunity will often be wanting to enable the most scrupulous and competent physician to determine the true cause of death with the required degree of scientific accuracy and completeness. In statistical practice it will often be found that the more obvious or self-evident causes require to be given secondary consideration, as for illustration, in the case of cancer jointly reported with bubonic plague, or pneumonia reported as a sequence to an accident. Autopsies or post-mortem examinations are unquestionably desirable in a much larger proportion of cases than is at present the fact, even in the experience of our foremost hospitals. The frequently suggested requirement of an autopsy in the case of every institutional death would, however, offer no final solution of the problem of accuracy in mortality statistics. The making of post-mortem examinations is as much a branch of science as bedside diagnosis on the part of the attending physician, and the conclusions arrived at by both methods may be widely at variance and yet each may be relatively true. Evidence of preëxisting disease disclosed by an autopsy may not warrant the conclusion that the original clinical diagnosis was erroneous and that the secondary cause or condition was directly related to the fatal termination. It has properly been observed in this connection that, "the cause of death is not always to be found in the organ primarily affected or which shows the most pronounced lesions." Autopsies are without doubt a most useful aid in medical education, and in fact are essential for the highest development of diagnostic skill. The outlook, however, is absolutely hopeless for securing an autopsy in the case of every death in a public institution, and at best and at most, therefore, the facts disclosed by existing methods of death registration can by their nature reveal the truth only with approximate accuracy.

The foregoing observations apply with peculiar force to cancer as a cause of death. The questions which require consideration are: First, whether the recorded cancer mortality at the present time is a true statement of the facts; second, whether the observed rate of increase in cancer frequency is real or only apparent because of recent improvements in diagnosis and methods of death registration and classification. To both of these important questions I feel confident an affirmative reply can be made with the reasonable assurance that present-day conclusions are a close approximation to the truth; in other words, the assertion that there are approximately 75,000 deaths from cancer per annum in the United States at the present time, and that the death-rate from malignant disease is on the increase at the rate of about 2.5 per cent. per annum, may safely be considered as approximately and relatively true. For all practical purposes it is immaterial whether the actual mortality from cancer is a little more or a little less; or whether the true rate of increase is or is not ascertainable within perhaps a fraction of a decimal. The two general conclusions resulting from our present statistical knowledge of the cancer problem are: First, that the disease is much more common than has generally been assumed to be the case; second, that the approximate mortality therefrom is such as to constitute cancer the fourth in importance as a cause of death in the United States at ages 45 and over.

These important and far-reaching conclusions rest fundamentally upon the approximate accuracy and completeness of our death registration and the accuracy of the medical diagnosis which determines the assignment of the final cause of death. Bashford, Cabot, Oertel, and others, have brought forward evidence to prove that our American vital statistics are intrinsically untrustworthy; that our clinical diagnoses are frequently seriously erroneous; and that the status of medical education and medical practice in the United States must be considered deplorable. Bashford has even gone so far as to assert that our American vital statistics are less trustworthy than those of Ceylon. Oertel rests his drastic conclusions upon 388 autopsies at Bellevue Hospital, of which, however, the clinical diagnosis in its entirety was not confirmed in 27.6 per cent. of the cases. In Oertel's own words, "Every one well informed knows that clinical diagnoses even by very good physicians are extremely uncertain; much more so, of course, when made by the ordinary practitioner." The conclusion requires only to be stated to emphasize its intrinsic untrustworthiness. He further observes that "internes and physicians are often utterly unconscious of the responsibility they carry in this matter (death certification). In private practice where autopsies are less frequent than in institutions things are apt to be even worse." And the final conclusions "that the only reliable death certificate is the one made by the experienced pathologist after autopsy," and "that the majority of clinical diagnoses are either wrong or grossly insufficient," are equally contrary to the facts and to common-sense.

In the *Lancet* for April 18, 1914, Oertel re-argues his case in apparently a very plausible manner, to the effect that, "our clinical records and death certificates are poor because our physicians lack the objective training that can be derived from necropsy and competent teachers." He maintains "that this uncertainty and inaccuracy is particularly great in the United States of America where the importance of necropsies and the study of pathological anatomy which are indispensable to good diagnostic ability have always been grossly neglected." No one familiar with the facts of American medical progress and confronted by the indisputable evidence of a low death-rate throughout practically the entire country and a material reduction in the death-rate during the last thirty years will be prepared to accept the foregoing conclusions, in general, nor in their special application to the cancer problem.

The several studies which have been made of diagnostic findings in the light of subsequent autopsies confirm the conclusion that the results as regards cancer were apparently much more satisfactory than in the case of many other important causes. The two most trustworthy investigations, by Cabot of Boston, and Rogers of Calcutta, substantiate the conclusion that in the main the clinical diagnosis of cancer deaths was reasonably accurate. The diagnosis of cancer is not as difficult as is often assumed to be the case, even without the aid of an exploratory surgical operation or the use of the microscope. This conclusion, of course, applies chiefly to external or conveniently accessible cancers, although even in the case of some of the internal cancers an accurate clinical diagnosis is frequently possible. The question under consideration does not involve the problem of clinical diagnosis of cancer in the initial stage, but only the final terminal diagnosis made just previous to the patient's death. Any one with much knowledge of actual cancer cases will confirm the conclusion that regardless of serious difference of opinion in a debatable number of cases, the large majority of fatal forms of cancer, whether external or internal, are not diagnosed with much difficulty or with a serious chance of error in the terminal stage.

Cancer is an ancient disease, and innumerable references thereto occur throughout medical literature from the earliest times. Granting that early conceptions regarding the nature of cancer were grotesquely erroneous, there is no evidence that the disease was ever considered indifferently or seriously confused with fundamentally different physiological or pathological processes. It would, of course, be absurd to maintain that no real progress has been made in the diagnosis of cancer, especially with reference to improvements in death certification. The argument, however, is advanced without the slightest fear of successful contradiction, that the better understanding of the nature and function of malignant disease which prevails at the present time cannot be assigned as an explanation for the observed material increase in the recorded cancer death-rate throughout civilized countries.

The table following exhibits the mortality from cancer in the registration area of the United States during the decade ending with 1912. In addition to the rate per 100,000 of population, the increase or decrease in the rate from one year to another is shown separately and the percentage of such changes, together with the relative rate for each year, assuming 1903 as 100.

MORTALITY FROM CANCER, U. S. REGISTRATION AREA, 1903-1912.

Period.	Population.	Deaths from cancer.	Rate per 100,000 population.	Increase or decrease in the rate.		Relative rate —1903 taken as 100.
				Actual.	Per cent.	
						No. per 100.
1903	32,701,083	22,325	68.3			100
1904	33,345,163	23,395	70.2	+1.9	2.8	103
1905	34,052,201	24,330	71.4	+1.2	1.7	105
1906	41,983,419	29,020	69.1	−2.3	3.2	101
1907	43,016,990	30,514	70.9	+1.8	2.6	104
1908	46,789,913	33,465	71.5	+0.6	0.8	105
1909	50,870,518	37,562	73.8	+2.3	3.2	108
1910	53,843,896	41,039	76.2	+2.4	3.3	112
1911	59,275,977	44,024	74.3	−1.9	2.5	109
1912	60,427,247	46,531	77.0	+2.7	3.6	113

This table is suggestive of the inherent trustworthiness of our cancer mortality statistics. The annual rate is shown to have varied more or less, but the general tendency has been persistently towards an increase, measured by the two extremes of a minimum rate of 68.3 for 1903 and a maximum rate of 77.0 for 1912. For seven out of the nine years following 1903 the rate increased, but during two years the rate declined. If, therefore, the argument were sound that the observed increase is the result of improved methods of diagnosis and death certification, then the observed decline during very recent years should be an explanation of the reverse. Such a conclusion would obviously be absurd. Compared with the year 1903 taken as 100, the relative rate for 1912 was 113; in other words, in that year the rate was 13 per cent. in excess of the rate ten years ago.

Some additional illustrations of the increase in cancer frequency follow for the purpose of illustrating the persistent upward tendency of the cancer death-rate throughout the United States. For example, the quarter-century cancer death-rate of Philadelphia during the period ending with 1888 was 42.6 per 100,000 of population, whereas during the last quarter-century ending with 1913, the rate was 69.0. There was therefore an actual excess in the rate of 26.4 per 100,000 of population. The corresponding increase in the cancer death-rate of New York City during the same period was from 46.5 to 70.5. The actual increase in the rate was therefore 24 per 100,000 of population. In New Orleans, Louisiana, the rate increased from 51.1 to 70.6, or 19.5 per 100,000 of population. The observed increase in the rate of these three representative large American cities was therefore in approximate conformity. It would be utterly incredible to assume that this increase measures only an improvement in medical diagnosis and death certification and not a greater liability to malignant disease. In fact, there are reasons for believing that during the earlier period under consideration a much larger proportion of tumors of the non-malignant type were classified as malignant; but it requires to be taken into consideration that the actual proportion of non-malignant tumors in the tumor mortality is not very large. It must further be considered that during the intervening period of years the results of operative treatment has shown a constant tendency to improve, as was well brought out in the very interesting address on the Progress of American Surgery, by Dr. F. S. Dennis, on the occasion of the International Congress of Arts and Sciences held in St. Louis in 1904. In consequence of operative treatment a considerable proportion of persons now die from other diseases than cancer and a small but significant number of cases occur in which suicide is preferred to a lingering death from what has not inappropriately been called the human scourge.

Taking the foregoing facts and observations into consideration it would seem a safe conclusion that the present-day liability to cancer is somewhat greater than shown by the mortality rate, because of the effects of operative treatment and other methods and means by which the lives of cancer patients are prolonged with the practical certainty of death resulting ultimately from some other cause.

As previously pointed out, cancer in the majority of cases is a perfectly obvious disease, not difficult of accurate diagnosis. The conclusions based upon the early Frankfurt data, advanced in the investigation of Messrs. Newsholme and King, are contradicted by the facts of subsequent experience. The argument advanced by these two distinguished authorities on medical and actuarial science was to the effect that the observed increase in cancer frequency had only affected inaccessible or internal cancers not admitting under non-operative conditions of an accurate diagnosis. The table following for the city of Frankfurt for two recent periods fully confirms the contrary conclusion that internal as well as external cancers are on the increase in that city, which is generally considered to have one of the most perfect systems of death certification in the world. It may be said in this connection, that the results for Frankfurt are fully confirmed by the critical analysis of recent English, Bavarian and American statistics.

This table is perhaps the most instructive contribution to our knowledge of the statistical aspects of the cancer problem. The table absolutely disproves the earlier theory regarding the non-increase in mortality from cancer of the external organs or parts.

The argument that the observed and recorded increase in cancer is primarily the result of improvements in diagnosis is not new. Walshe, in his treatise of 1844, refers to the greater accuracy of diagnosis as a probable explanation of the steady increase in cancer mortality during the previous century. Coley in a statistical discussion on the increase in cancer mortality, published in 1909, has advanced the claim that "actually the death rate from cancer is *far* greater than the rate shown by the vital statistics, for the reason that there is prevalent among the laity a strong prejudice against the name 'cancer,' the result being that in *many* cases of death from cancer, especially metastatic cancer, with internal complications, the family physician out of respect for this feeling on the part of the family, will assign some of the secondary causes in place of the actual primary cause of malignant disease." This statement is not substantiated by any facts derived from actual experience. That some such cases may occur is self-evident; but that in a large number of such cases there should be a deliberate falsification of the death certificate is incredible. As a matter of fact, it is very rarely that a death certificate itself comes to the notice of the family of the deceased. Coley also refers to the earlier investigations by Guliot of Rheims, who made a study of the accuracy of certified cases of cancer with the result that he found that the number who had actually died of the disease was exactly double the number certified to have

MORTALITY FROM CANCER IN FRANKFURT—A. M., BY ORGANS AND PARTS OF THE BODY, ACCORDING TO SEX, 1906-09 AND 1910-13.

MALES.

Organs.	Deaths from cancer.		Rates per 100,000 population.		Increase or decrease in percentage.
	1906-09.	1910-13.	1906-09.	1910-13.	
Skin	3	6	0.4	0.8	100.0
Digestive organs	470	540	68.5	74.2	8.3
Respiratory organs	32	23	4.7	3.2	−31.9
Urinary organs	21	27	3.1	3.7	19.4
Generative organs	6	8	0.9	1.1	22.2
Other carcinoma	25	29	3.6	4.0	11.1
Sarcoma	28	35	4.1	4.8	17.1
Other malignant tumors	23	46	3.3	6.4	93.9
Total	608	714	88.6	98.2	10.8

FEMALES.

Organs.	Deaths from cancer.		Rates per 100,000 population.		Increase or decrease in percentage.
	1906-09.	1910-13.	1906-09.	1910-13.	
Skin	12	8	1.5	0.9	−40.0
Digestive organs	447	500	54.4	57.2	5.1
Respiratory organs	25	17	3.0	1.9	−36.7
Urinary organs	5	20	0.6	2.3	283.3
Generative organs	244	288	29.7	33.0	11.1
Other carcinoma	76	80	9.2	9.2	0.0
Sarcoma	26	30	3.2	3.4	6.3
Other malignant tumors	24	48	2.9	5.6	93.1
Total	859	991	104.5	113.5	8.6

so died. This statement is also open to the same objection that the necessary evidence in detail is not supplied in a conclusive and trustworthy manner. In contrast to the point of view that the observed increase in cancer is the result of improved diagnosis, Coley refers to the conclusions of Mitchel Banks, in his opinion one of the most careful students of cancer in Great Britain, to the effect that "while the diagnosis of cancer in its early stages was probably made much more frequently now than in former times, it required little skill to make the diagnosis at the time of the death of the patient," and that "the diagnosis at such a time was by no means beyond the ability of even the rural practitioner of fifty years ago."

W. R. Williams, in this connection, has pointed out that the actual increase in cancer during a long period of years has been so enormous as to preclude the possibility of the same being chiefly or largely due to improved diagnosis. The same author has called attention to the important fact that in earlier years many diseases were diagnosed as cancer or classified as such which would now be returned under other terms.

The subject has been discussed by Lawrence Irwell in a contribution to the *Insurance Age* (May, 1913), with special reference to incomplete death certification, or rather the absence of a mention of the organ or part of the body affected by the cancerous growth. He maintains that cancer deaths without a mention of the site of the disease should not be taken to mean that the decedent necessarily died of cancer, because if the physician who was responsible for the document did not know where the neoplasm was located, he was not in a position to certify that a malignant tumor was primarily responsible for his patient's death. This point of view is not well taken, because in former years it was considered fully sufficient, and in a general way it is even now under prevailing methods of registration, to return an unquestionable death from cancer without mention of the organ or part of the body affected. The omission is not evidence of inability on the part of the physician to properly diagnose the case, but simply a want of proper appreciation of the statistical significance of additional details.

There are numerous references in the medical literature of the subject to the larger number of demonstrated cases of cancer on autopsy than were recognized during the lifetime of the patient. Riechelmann, among others, has shown that in the Berlin hospitals 20 per cent. of the cases found on autopsy to have been deaths from cancer were not previously recognized as such. More modern findings to the same effect are merely cumulative evidence of a fact quite generally known and understood among those familiar with cancer diagnosis. As previously stated, there can be no question of doubt but that autopsies or post-mortem examinations would in a number of cases disclose evidence of cancer lesions without necessarily warranting the conclusion that under the present methods of death certification a reasonable degree of accuracy in the returns is not obtained. Hospital patients, particularly those of public institutions, are not a suitable class of subjects for investigations of this kind. Under the serious limitations of public hospital practice it must often be much more difficult to make a satisfactory diagnosis of the cause of death than in private practice. A large number of hospital patients are but a short time under observation; they are of a class from which it is often difficult to obtain a true past history of the disease on admission, and it is unfortunately true that the medical attendance is frequently superficial and indifferent. At most, such cases do not constitute more than from 5 to 10 per cent. of the mortality from all causes, and the chance of error, even if as high as 20 per cent. in a particular disease, would not be likely to very seriously affect conclusions based upon aggregate mortality returns. The results of specialized research in this direction are of the greatest practical value to students of medicine, and most of all in the teaching of medicine on the basis of accurately determined pathological conditions. Improvements are necessary in medical diagnosis and methods of death certification, but the existing amount of error in both ought not to be made the basis of an effort to destroy public faith in returns which in the main faithfully and conclusively reflect a true state of facts.

In its final analysis the cancer mortality problem rests upon the statistical law of large numbers. Errors or defects in the quality of the original data have a normal tendency to balance each other. If the argument is sound that the increase in cancer is entirely the result of improved methods in death certification or medical diagnosis, then a decrease in the cancer death-rate would obviously establish the reverse. While it is true that the general tendency of the cancer death-rate throughout the world is in an upward direction, there are numerous important exceptions to this conclusion. Even in the United States, and in some of our large cities, the cancer death-rate has in some years actually decreased. No one would maintain that this decline in the rate was the result of diminished medical or statistical efficiency. Observed over a long period of time the cancer death-rate, however, shows an unmistakable and practically universal upward tendency. Regardless of the controversy whether the rate is actually increasing or only apparently so, the menace of cancer is today conclusively established, and the fact cannot be gainsaid by anyone that the annual loss of life due to this frightful scourge is now approximately 75,000; and being practically limited to ages 30 and over, the disease is therefore of the greatest importance and its effectual control is a pressing problem of public policy. There is little to be gained by the largely academic discussions as to whether cancer is actually or relatively on the increase, or whether there is a small margin of even serious errors in the quality of the fundamental underlying facts. There is likely to result much harm, however, from discussions which tend to impair public confidence in the trustworthiness and conclusiveness of the facts derived from official sources, and a resulting lack of public interest in the essential problems and practical methods of a nation-wide effort at cancer control. The burden of proof that the existing data on cancer mortality are untrustworthy and misleading rests upon those who make the assertions; but all that has thus far been published in support of such allegations, pretensions or speculations fails to substantiate the point of view.*

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* NOTE. The recent investigation of the coroner's office in New York City adds additional information to the debatable question as to how far the aggregate mortality returns are impaired in value by erroneous or even fraudulent returns made in the relatively small group of cases which properly require the coroner's attention. There can be no question but that the evidence is quite conclusive that the number of autopsies and post-mortem examinations made in so large a city as New York is ridiculously small. Not only from a medical standpoint, but also from the point of view of legal jurisprudence, the present conditions are deplorable. It is true, no doubt, that in many suspicious deaths the exact cause is not established and the coroner's records are undoubtedly misleading, especially as regards the causes of death, which are frequently not verified. That these conditions have a bearing upon the problem under consideration cannot be questioned; but I feel confident that in so far as these conclusions affect the cancer problem they may safely be considered of small importance, for the coroner's cases are chiefly representative of a class which is not typical of cancer patients. A large number of cases are infants and a considerable proportion represent sudden deaths due to natural causes, which can only include a relatively small number of cancer cases. The highest degree of accuracy is unquestionably desirable, but it would be most unfortunate if public confidence in the value of the available statistics were destroyed because of a margin of error which cannot be considered as sufficient to invalidate general conclusions.

THE PREVALENCE OF OCCUPATIONAL FACTORS IN DISEASE AND SUGGESTIONS FOR THEIR ELIMINATION.

RESULTS OF A STUDY CONDUCTED AT THE CENTRAL FREE DISPENSARY (RUSH MEDICAL COLLEGE) AND COOK COUNTY HOSPITAL, CHICAGO.

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THE purpose of this paper is, first, to point out the socially wasteful practice of administering daily to person after person for the same types of morbidity, due to the same causes, and, secondly, to emphasize a much neglected sphere of etiology, the proper conception of which is contained in the term "industrial relations."

The research summarizes a study of (1) United States Census Mortality Statistics of Occupations; (2) 65,000 dispensary records and many hundreds of cases personally seen during a two year period at Rush Medical College (Central Free Dispensary); and (3) the medical portion of 27,887 cases in which the patients received treatment in Cook County Hospital during the year 1913.

(1) Attention is first directed to an arrangement of mortality statistics somewhat different than forms customarily shown. An analysis of the Mortality Statistics of 210,507 persons engaged in 140 occupations in the Registration Area of the United States exhibits the percentages, for the census year 1909 (the only year in which complete tables were published) given in Table 1.

From the table we see a marked difference in the prevalence of certain wasteful death causes between the two classes compared, We also note that the agriculturist stands a one-in-three chance of reaching old age (70 years), while the others' probability is but little better than one-in-eight. None can fail to grasp the significance of this table. To disclaim the importance of these figures on the basis of incorrect diagnoses and uncertainty of occupations is unjust. The fact that only the registration area is included, and the recency of the reports answers the first point. As to the second feature, Wilbur[1] has shown that where another or previous occupation could have been a factor, it amounts to less than 1 per cent., which is less than ordinary errors of transcription.

(2) Before proceeding further it is necessary to explain one or two terms. *Industrial health-hazards* may be defined as working conditions which, while they may not impair the more resistent worker until after a prolonged

TABLE 1.

MORTALITY AMONG OCCUPIED MALES.*

	Those in agricultural pursuits.	Those in 131 trades and callings.
	Percentages of all deaths.	Percentages of all deaths.
Deaths from *preventable* causes ($\frac{6}{7}$ are diseases)†	27.4	43.0
Deaths from *degenerative* diseases (under 70 years of age)‡	26.5	31.2
Total deaths after 70 years of age	35.9	13.4

* *Occupied males* include professional callings, officials and proprietors, those engaged in domestic and personal services as well as those we ordinarily term real workers, namely, those in trade and transportation, manufacturing and mechanical pursuits, miners, quarrymen, etc., composing a total of 140 chief occupations—including those engaged in 9 agricultural pursuits.

† Deaths from *preventable causes* include typhoid fever, pulmonary tuberculosis, pneumonia (under 70 years), alcohol, lead poisoning, other occupational poisonings, suicide, accidental poisonings, accidents and injuries, rheumatism, bronchitis, pleurisy and hernia—for the last four, only such deaths as have occurred under 70 years are included.

‡ Deaths from *degenerative diseases* include cancer, diabetes, apoplexy, heart disease, "other circulatory diseases" (4,858), asthma, cirrhosis of the liver, "other liver diseases" (880), and Bright's Disease. There remain in the census classification, 27,105 deaths from peritonitis, appendicitis, "other respiratory, digestive, nervous," and "all other causes," a large percentage of which were also undoubtedly preventable or prematurely degenerative, but which are not taken into consideration in the classification given above.

period, produce morbid conditions in the average worker, and tend ultimately to create preventable and degenerative diseases in all persons so subjected. The hazards, arranged schematically in order the better to remember them, are (1) dust, (2) dampness, (3) darkness, (4) devitalized air (including motionless and vitiated air), (5) heat, (6) cold, (7) fatigue, (8) inactivity, (9) compressed air, (10) infections, (11) poisons, and (12) industrial *stimulantism*—the latter a common condition created by the belief among many workers that alcohol, strong coffee, etc., limit or counteract the effects of dust, poisons and other hazards; it is also promoted by dirty, disordered and depressing surroundings and the absence of proper thirst-assuaging facilities at the work-place. It is understood that each of the above-named hazards stands for a class of component hazards.[2]

Among 65,000 different applicants at Rush Medical College (Central Free Dispensary) there were 15,475 persons with definite trades. Professional persons, laborers, housewives and nondescripts were excluded in summarizing. Of this number 10,370 had afflictions deemed not occupational or controversially so, and were also excluded—such were venereal, surgical, and acute infectious diseases; sexual, senile, and certain skin, ocular (including refractive errors), ear, nose, throat and some nervous diseases. Certain trade tendencies could be noted in many of these; a good part of the surgical cases were strictly occupational. The balance, or 5,105 trades persons, or about one-third the total number of trades persons, worked at occupations having definite health-hazards, and had afflictions which such hazards were producing and definitely promoting. Such circumstances would render them applicants for industrial compensation for occupational diseases according to many foreign provisions[3]—"the diseases (scheduled) shall be deemed to have been due to the nature of that employment unless the contrary is proved,"—the burden of proof lying upon the employer, who has to show that the worker has not been subjected to work hazards which could produce the disease in question.

Among 2,500 consecutive applicants at the Central Free Dispensary Branch of the Chicago Tuberculosis Institute were 875 trades persons engaged in occupations surrounded with definite and well known health-hazards. Of this number 615 were found to be tuberculous, 125 were not positively diagnosed and the balance were not suffering from tuberculosis. Of 368 patients who were intelligent and answered questions, 259 made complaints of working conditions involving dust, light, dampness and ventilation. Their statements were not taken as to the more insiduous hazards such as poisons, fatigue effects, liability to communicable diseases, temperature exposures, and industrial alcoholism.

(3) In Cook County Hospital in the year 1913 there were 11,022 adult medical cases. Of this number, at least 2,866, or about 27 per cent. were persons engaged in definite trades having well known health-hazards and were suffering with afflictions which were induced or promoted by such hazards. None of these, so far as we know, received compensation or even condolence from the sources responsible, nor indeed were their cases investigated by an executive branch of the government.[4]

It might be considered advisable to give a division of *all* of these 11,022 persons by "occupations" and by diseases. This was attempted, but it suffices to say that a large majority of this class of "down and out" patients have no regular occupations, and that, also, the term "occupation" as used in a charitable institution of this sort is capable of such loose construction that, unless each case is painstakingly examined, records and casual statements more often mislead than direct. The term "laborer," for instance, was found to apply to practically all occupations.

In the hospital diagnoses of these 11,022 medical cases, one finds none classified under the head of "occupational," or "industrial" diseases. Turning next, however, to the prominent poisons, and running them through, the records disclose cases charged to industry as given in Table 2.

TABLE 2.

CASES OF POISONING CHARGED TO INDUSTRY.

	No. of patients.
Lead poisoning	47
Arsenic poisoning	3
Wood alcohol poisoning	1

But if such a search is extended to *disease which might be occupational,*—such as dermatitis, eczema, bronchitis, tuberculosis, heat-exhaustion, tetanus, flat-foot, lumbago, rheumatism, constipation, gastritis, pancreatitis, appendicitis, nephritis, neuritis, and particularly neurasthenia, one finds many comments upon the history sheets savoring of occupational etiology. In fact, after such a search one comes to the conclusion that almost any medical complaint may be occupational, or at least may have in its etiology an important occupational factor!

As limited in number as are the *lead poisoning cases* above noted they are more frequent in occurrence than in the year 1910 in the same hospital. In spite of all legislation which followed the report of the investigation by the Illinois Commission upon Occupational Diseases in the year 1910, they have still continued to come[5] and in several instances from the same identical workplaces.

An analysis of the principal symptoms given on the history records used for arriving at a diagnosis in the cases of plumbism is given in Table 3. It is based upon forty-six of the cases, as one patient absconded from the hospital before clinical features could be determined:

TABLE 3.

PRINCIPAL SYMPTOMS IN FORTY-SIX CASES OF PLUMBISM.

	Per cent.		Per cent.
Colic	98	Basophilic degeneration	43
Constipation	91	Headache	42
Lead line	80	Albumen and casts	29
Vomiting	78	Multiple neuritis	27
High blood pressure*	75	Wrist drop†	18

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* Determined in only 16 cases. In no case was it less than 125 mm. Hg., but in 12 cases it was more than 100 plus the age in years.

† The detection of lead paresis, preceding paralysis, can be made early, in the case of the arms, by the use of the hand dynamometer. (See "Critical Examination of One Hundred Painters for Evidences of Lead Poisoning," E. R. Hayhurst, Am. Jr. of the Med. Sc., June, 1914, CXLVII, 6, 788–810.)

The high percentage of lead lines shows quite conclusively that many cases without lead lines were not diagnosed as plumbism, since this sign is certainly not present in over one third of even acute cases. Most lead workers are instructed and have learned to take "salts" regularly and as a result do not suffer much from colic, constipation, vomiting and headache, but they do suffer nevertheless from chronic plumbism as is shown by weakened neuromuscular function, blood pressure determinations, facial pallor, impaired nutrition, affected kidneys, hardened arteries and fundus oculi examinations.

Analyses show that a total of 530 patients were engaged in processes which exposed them to lead in its various forms. As mentioned above, but forty-seven cases were recognized as industrially poisoned in the scrutiny of the histories of these cases. Among the balance we cite below the details of 25 selected cases. Space alone limits the publishing of many times this number. I do not question the diagnoses made, necessarily, but wish to comment upon their incompleteness. (The hospital diagnosis is given first, with civil statistics, and some of the symptoms; then the results, in briefest form, of our own investigations in connection with each case):

Case 1.—Aortic Aneurism. Laborer, aged 52, U. S., signs of aneurism, with symptoms of angina pectoris. Symptoms beginning four months previously. Found to have worked for the past three years in a lead factory, inordinately exposed to lead. This case ended fatally, presumably by rupture of the aneurism. Four and one-half months in the hospital.

Case 2.—Alcoholic neuritis and *nephritis.* Laborer, aged 40, U. S. Found to had have an attack of acute plumbism 2 months before, with wrist drop. Had his first attack 12 years before.

Case 3—Musculo-spiral paralysis and *multiple neuritis.* Laborer, aged 32, Pole, double wrist drop, blue line, basophilic degeneration. Found to be a lead worker. Later suing his employers for his condition. How much the hospital diagnosis will help or hinder his suit is left to the reader to conjecture.

Case 4.—Arterio-sclerosis. Painter (general), aged 54, U. S. History of several lead poisoning attacks and in the hospital but a few months before, for "lumbago."

Case 5.—Neurasthenia. Plater, aged 27, Pole, first symptoms appeared 3 months previous. Found to work at electroplating, in a place where he was exposed to lead in almost every form (fumes, dust and solutions).

Case 6.—Chronic interstitial nephritis and *myocarditis.* Painter, aged 59, German. Found to have worked in a sign-shop for years, under close confinement, doing a great deal of sandpapering of painted surfaces, and to have had several acute attacks of plumbism during the past 13 years. (Died after 18 days in hospital.)

Case 7.—Chronic parenchymatous nephritis. Painter (general), aged 34, American. Found to have had 3 attacks of undoubted acute plumbism in the past 16 years.

Case 8.—Constipation. "Iron molder"—such was his regular trade, but he worked in a paint factory for one week, putting paint in cans—aged 38, Pole; symptoms acute. Stated that the workroom was filled with dry paint dust, and that masks were "more or less" constantly worn.

Case 9.—Pus appendix, gangrenous (diagnosis made by abdominal section). Russian, aged 31, within the past year a farmer in Russia. Sick for past 4 months. Found to be a white lead molder, and made great complaint of the amount of lead fumes and dust he was compelled to breathe. Place of employment the same from which 4 other cases of lead poisoning had come to this one hospital within the period of our observations.

Case 10.—Pelvic abscess (right). Painter (general), aged 52, Swede. Sick 2 weeks before entering hospital. Had a slight blue line and complained of attacks of colic. Death the third day in hospital.

Case 11.—Delirium tremens (incipient). Painter (general), aged 57, Irish. Several attacks of lead poisoning in the past 40 years. Now complaining of colic and cramp-like pains in all extremities.

Case 12.—Acute rheumatic fever. Wagon painter, aged 56, Irish. Complained of pains in hands and feet. Has had lead poisoning several times in the past 13 years.

Case 13.—Acute gastritis, lead poisoning (history record filed under first head). Iron fitter, aged 35, German. Blue line and colic for past 3 weeks. Also attack of colic 9 months ago. Found to be engaged at painting with red lead, and also doing house painting, on the side.

Case 14.—Organic heart disease and *acute pharyngitis.* Plumber, aged 35, U. S. Complaint, palpitation and sore throat. Found to have had symptoms of lead poisoning in this same hospital one year previous.

Case 15.—Chronic constipation, brass poisoning. Brass factory worker, aged 37, Russian. Complained of colic, and has a typical blue line at gum margins. (There are no symptoms in this case suggestive of "brass poisoning.")

Case 16.—Chronic rheumatism and *acute uremia.* Painter (general), aged 60, Irish. Sick for past 2 months. Entered hospital in semicomotose condition with convulsions. Found to have had lead poisoning as far back as 20 years. (Case eventually improved enough to leave hospital.)

Case 17.—Brass poisoning. Brass molder, aged 28, Pole; colic and obstipation. Had a blue line and marked basophilic degeneration. (This is a plain case of lead poisoning, however, in a brass molder.)

Case 18.—Pellagra. Brass grinder, aged 38, U. S. Sick 2 months. Had a distinct blue line, also pigmentation and edema of face, neck and hands. Found to have worked at the same place in Chicago for the past 4 years, and to have had lead colic and wrist drop 11 years previously (same occupation).

Case 19.—Brass poisoning. Filer of brass and lead, aged 28, Lithuanian. Had severe digestive disturbances for 8 weeks, also pallor, emaciation, lumbar and abdominal pain with tenderness, a blue line and hemoglobin 60 per cent. Found to have been a meat wagon driver until 3 months ago, when began work at present place, where he complained of marked fumes, dust and steam. (This is another plain case of lead poisoning.)

Case 20.—Catarrhal jaundice. Laborer, aged 28, Greek. Sick 21 days,—colic. Found to be a lead smelterer, and from the same place where several other positive cases of lead poisoning occurred, several of whom entered this hospital within the past year. The firm is an old offender.

Case 21.—Chronic nephritis and acute fibrinous pleurisy. Painter (general), aged 48, Scotch. Complaint: pains in chest and back. First attack 5 months ago. Weakness in wrist and hand grip as tested by hand dynamometer. Painter for the past 30 years.

Case 22.—Acute appendicitis—at operation appendix could not be found, but there was a local peritonitis. Laborer, aged 39, Italian. Complaint: colic. Sick 5 hours. Found to be a worker in a paint factory.

Case 23.—Infected amputation stump. (The discharge diagnosis from a medical ward appears to have been sort of a compromise, since nothing of definite inflammatory character developed in the stump after 2 weeks in the hospital.) Painter, aged 43, U. S. Complaint: general symptoms for the past 2 months, most pronounced in amputation stump. Probably chronic alcoholism also a factor. However, was in hospital 3 years previously for plumbism.

Case 24.—Neurasthenia. Painter, aged 42, Hungarian. Complaint, abdominal pain. Had similar attacks off and on for the past 4 years. Found to be a passenger car painter, and complained strongly of breathing paint dust. There have been many cases of lead poisoning reported, both at this hospital and elsewhere, among his fellow workers.

Case 25.—Para-typhoid fever. Battery assembler, aged 23, Lithuanian; abdominal colic, blue line. Found to work in a storage battery factory, exposed to much lead dust. Also had all symptoms of lead colic 8 months previous.

This series illustrates how easy it is for primarily occupationally diseased cases to be lost sight of in terminal complications; the necessity of going deeply into the exact occupational risks which the patient has endured; and the lack of significance of the term "laborer." Furthermore, these cases emphasize very well the social waste in continuing to treat, and failing to diagnose etiologically cases which keep coming from the same sources, trades and callings year after year.

Industrial *arsenic* poisoning is not frequent in Chicago, yet the three cases noted above were hardly one fourth of the total in this one hospital; another ten cases (all acute), which we could discover, were termed "dermatitis," "eczema," and "acute gastritis." In this connection it is well to state that, in several instances these patients gave their previous regular occupations, such as "boilermaker," "electrician," and "jeweler," instead of mentioning their recent arsenic-industry employment, when questioned by the hospital entry clerks.

The three diseases given in Table 4 were correlated with occupations of the patients; the figures give the numbers which were in whole or in part occupational in character:

TABLE 4.

OCCUPATIONAL CASES IN THREE DISEASES.

	No. of patients.
Chronic nephritis	265
Rheumatism (various forms)	417
Organic heart disease	333

In the case of the latter disease it is well to mention the efforts now being made in New York and at Cincinnati to select proper forms of work for such patients after discharge, in order to prevent occurrence and recurrence of non-compensation and consequent return to hospitals.

No cases were recorded of *pneumonoconiosis*, or of its various forms, as *siderosis, chalicosis, aluminosis*, etc., although there were a total of 134 cases of *chronic bronchitis* without efforts at etiologic diagnosis.

There were recorded 229 cases of *arterio-sclerosis.* Unfortunately an idea of the extent to which fatigue-substances, heat-toxins, and extrinsic poisons of industrial origin may have entered into this class of cases can rarely be gained from present day histories anywhere, hence any idea of using the information for shutting off the income of such cases is at once precluded. They are all charged apparently to the account of moral hazards, or disease misfortunes.

There were 156 cases of *neuritis* of various types. While the preponderance of alcoholism and drugging as causal may be admitted, each should be searched for the likelihood of industrial poisoning, both extrinsic and intrinsic. For example, multiple neuritis occurs at a given rate among all alcoholics, but among those exposed to lead it is unusually common. We did not find time to go into these.

There were 157 cases of *neurasthenia* for which no other cause could be found than exhaustion, and we know that every effort was made by diagnosticians to keep this number minimal. Why should not the cause of such exhaustion be inquired into with the idea of naming it etiologically, and, if industrial, as it probably is in 90 per cent. of the cases, of recording it as "*occupational* neurasthenia"? If each such case were looked at from this point of view, corrective agencies would have a case to investigate.

There were twenty-eight cases of pes planus, fifteen cases of tetanus, and numerous cases of skin disease, heat exhaustion, neuralgia, uremia, etc. Here and there was a mention of work etiology, but the mention was productive of nothing. In fact it was lost sight of entirely through the absence of a heading in the filing system under which to place "occupational complaints." It is largely on this account that so few occupational diseases can be found in institutional records anywhere (they are nearly all alike in this respect) when one intuitively feels they are omnipresent, especially if any field work has been done in industrial health-hazards.

During the course of the year 1913, there were in the hospital *2,230 adult cases of tuberculosis* (I understand that not over 50 of these were "repeats"), 1,800 males and 430 females. One may safely say that practically none of these had active tuberculosis at the age of 14 years! The question is why and how have they acquired it since? How many of them would have it now had they lived an agrarian existence, for instance? The predisposing causes of their tuberculosis may be placed under three heads. (1) Moral hazards, (2) domestic or housing hazards, and (3) industrial hazards. These three factors operating, perhaps, in unison, have caused either a reawakening of latent childhood infection, or have invited environmental infection. Without disregarding the importance of the first two hazards, I am of the opinion that the importance of industrial hazards has been greatly underestimated in almost every case, and that it is useless to fight tuberculosis unless the daily eight to twelve hours of vocation be investigated and supervised. The so-called "occupations" under which these

2,230 tuberculous persons were registered give practically no information of value. For this, it would be necessary to individualize cases. The records show one thing which is certain, however,—that *they keep coming*, and very largely from the same *environments*. One important analysis shows that there was a total of 672 medical patients in the hospital engaged in dusty trades, of whom 284, or 38 per cent. were tuberculous. This is almost double the general tuberculosis rate among the medical (adult) cases in the hospital (20.2%). For "laborers," as a class, the percentage of tuberculosis was 23.3 per cent.

A principal feature is all these cases is to determine exactly the occupations. The principal result should be an etiologic diagnosis as far as possible, including the use of qualifyingterms such as "bronchitis, occupational," "neuritis, chiefly occupational," "aortic aneurism, probably occupational," "nephritis—alcoholic and lead," etc. This is similar to uses elsewhere, as seen in such descriptive terms as *puerperal* sepsis, *tuberculous* pneumonia, *typhoid* fever, and diabetes *mellitus*.

It must not be forgotten that patients themselves are densely ignorant of what constitute health-hazards; that they calmly accept them as a matter-of-course, and unworthy of notice; that the competition for work is great, and (one comes to realize) so much greater than everything else is *the innate desire in man to work*, especially before middle life—a desire which, in the normal man, equals his appetite and seeks to be satisfied in spite of all conditions.

SUGGESTIONS FOR THE SOLUTION OF THE PROBLEM OF OCCUPATIONAL DISEASES.

The health-hazards of industry which cannot be feasibly removed are insignificant in number.[7] The best proof is the fact that certain establishments engaged in the industries and processes in question have circumvented such hazards, and invariably to the improvement of production, as well as labor attitude and relations.

(1) First, there is needed a nomenclature to designate properly what is meant by "occupation." No one word will do this. The word "occupation" as used in medical parlance, hospitals, institutions, anti-tuberculosis society records, etc., should be abolished absolutely. A little study of some of the application blanks of insurance companies, particularly those carrying sickness insurance, offers many suggestions to framers of history sheets, social statistics, nurses' records, etc. After considerable study, and several years of field and statistical experience with this question, we have evolved and are using a scheme to take the place of the word "occupation" as outlined in Table 5.

TABLE V.

SCHEME TO TAKE THE PLACE OF THE WORD "OCCUPATION."

INDUSTRIAL RELATIONS.

(As Stated by the Patient.)

	Present.	Past.	Previous (to past).*
1. Name of employer			
2. Address of employer			
3. Business of employer			
4. Calendar years worked here			
5. Department(s) worked in			
6. Particular process(es) engaged in			
7. Health-hazards† exposed to			

* For acute afflictions it is not necessary to go back beyond a few days or weeks, perhaps. For recurrent afflictions one should go back months or years. For chronic afflictions it is necessary to go back preferably five years or more. It is not to be expected that the busy entry clerk will fill out this record. It should be the duty of the history taker, oftentimes with the aid of an interpreter, and, if significant, even with outside assistance.

† Question "7" should be answered wherever there is any possible relationship between the patient's affliction and his industrial relations.

The above is not dissimilar to what is ordinarily inquired into by the average insurance company. The question at once arises, Should not social and charitable institutions demand just as thorough an investigation of industrial relations as a sickness insurance company? Certainly the taxpayers of a community have a right to demand as much.

(2) It is a serious handicap to many interests that there is today no logical classification of occupations in existence. To different persons the same term conveys quite dissimilar intelligence.—With the information obtained from the use of the blank form above, a *logical classification of occupations* may be attempted. While the names and addresses of employers are not necessary for the classification in question, they should be required on all institutional case records as legitimate information pertinent to the care and supervision of the case. With the facts secured by answers 3, 5 and 6, any given type of worker and all of his kind may be descriptively and distinctively classified. A scheme to classify occupations must collate "industry," "business department" and "trade process." It therefore requires three descriptive terms to do this. "Industry" must be considered, because, for example, a fireman at a zinc smelter-works is subject to considerably different hazards than a fireman in the boiler room of a public building; "business department," because, for example, a cook with

a railway construction gang has considerably different hazards than a cook on a railway dining-car, etc. Let us apply this principle to a heterogeneous collection of workers (Table 6).

TABLE 6.

THE COMPLETE STATEMENT FOR "OCCUPATION."

Industry.	Department.	Process.
Pottery	Clay shop	Jiggerman
Pottery	Glaze room	Dipper
Vehicle	*Painting*	Painter and sander
Agr. implements	*Painting*	Dip machine laborer
Iron and steel	Butt mill	*Furnaceman*
Brass and bronze	Foundry	*Furnaceman*
Iron founding	Foundry	Laborer
Any business	Nondescript	Laborer

In this way it is possible to classify anyone's trade or calling exactly. As in the case of "iron foundry," redundancies seemingly occur, but these are only apparent; for all the information obtained is necessary to exactly identify each worker's industrial application and environment.

It is not necessary for two persons to describe the terms exactly alike for a given case; nor, in the case of the same activities at two separate places, is it necessary to have descriptions identical, word for word. The information given under the three headings will invariably convey intelligence enough to enable a third person to comprehend fully just what is meant. The statistician is at liberty, furthermore, to enlarge the groups so as to come under the usual general industrial headings: agriculture, professions, personal service, trade and transportation, manufacturing and mechanical pursuits, and miscellaneous.

(3) With the occupation definitely known and the health-hazards recorded, the weight of these in the affliction at hand can be estimated. The next step is to *investigate and verify* the patient's statements. Right here is where our system of social service fails. It is at present nobody's official business to attend to this.—This function should constitute a part of the *statutory business of the community health department* whose findings, when positive, with recommendations and suggestions, should be given over to the proper (state) executive department. It should also become a corollary obligation on this health body to lead in the hygienic education

of the workers, and to some extent of the employers, by drawing up rules and regulations to be observed by both of them and to be posted in workplaces as health-placards. This last function should not be hampered by having to wait for preparatory legislation aimed at each line of industry, as is now the usual manner of remedying such conditions. This power is just as much the rightful function of the health body as any of the offices it now performs. *This power should be legalized and made mandatory on the health body.*

(4) The enforcement of such regulations should depend, in the end, on the *compensation principle*, by which the employer will soon undertake to supervise his own plant, quite independent of the state's enforcement, as well as the health of his workers, both in and beyond the workplace, the latter on the now accepted theory that the employer has a right to demand "his money value for his expenditure for labor." Physical supervision, medical examination of employees, and a better selection of workers for the job will be the first effects of this system, while workers whose sicknesses are the results of moral or domestic hazards will soon be educated into line, or eliminated from industry. As industrial relations usually determine home conditions and habits, it would appear rational at all times to make an attack on delinquent social conditions at the place of employment.

· SUMMARY.

As a result of considerable study of hospital and dispensary cases and records, of vital statistics, and of field investigations, we reach the following conclusions:

(1) Occupied persons, other than agriculturists, suffer an enormous mortality (figures show 74 per cent.) from well-recognized preventable and prematurely degenerative diseases.

(2) Occupational diseases exist because industrial health-hazards exist. Responsible employers do not realize the existence of either, while treating agencies take little cognizance of employments.

(3) From one-fourth to one-third of the medical afflictions of tradespersons are due in whole, or in great part to industrial health-hazards.

(4) In institutions, the vast majority of industrial diseases are lost sight of through failure to properly recognize the industrial relations of the patients; to make etiologic diagnoses; and to classify properly in subsequent filing.

(5) Specific occupational diseases, such as lead poisoning, are not recognized in more than one out of three or four instances, more especially the chronic cases.

(6) Present-day institutional records are of value only in showing the enormous numbers of representatives of groups of industrial pursuits who are below the physiologic normal, and who seek medical aid for preventable afflictions. Such records have little value to the student of economics.

(7) A most important first remedy is a proper nomenclature for industrial relations to take the place of the word "occupation." Such a nomenclature is here propounded. The chief feature of this is the introduction of the term "industry-department-process" for the word "occupation." Adoption of this proposed term, furthermore, renders a logical classification of occupations possible. No such classification now exists.

(8) The powers and functions of the community health-governing body should be extended to the prompt investigation of all industrial complaints, and to the prompt remedying of them without the necessity of preliminary legislation against certain alleged responsible industries.

(9) In spite of the fact that the state in which this study was made has an Occupational Disease Law, workers are still coming into its charitable institutions from the same types of trades, and in some instances, from the same manufacturing establishments, in even greater numbers than at a period three years previous, when the Illnois Commission on Occupational Diseases made its investigation. This, we charge, is most directly due to the non-existence of a correlating body between the hospital and the factory.

(10) Too much importance is usually given to alcoholism, with a failure to appreciate that subjection to industrial health-hazards in itself induces and promotes stimulantism.

As a noted health officer has stated, many occupational afflictions might well be made the subject of a grand jury investigation, and others, of a coroner's inquest. The enormity of the public and private sums now spent on preventable sickness and death should induce those who pay the tax to bend every effort to run down these contributary factors and abolish them.

Acknowledgment is made of the valuable assistance rendered by Drs. Pauline R. Kapsa, C. A. Link, Alvin Thompson and F. B. Smith, of Chicago in the accumulation of statistics and material contained herein.

BIBLIOGRAPHY.

[1] Wilbur, Cressy L. "Vital Statistics in the United States," Am. Jr. Pub. Health, Dec., 1913, p. 1258.

[2] The Ohio State Board of Health, in the survey of industrial hygiene and occupational diseases which it is now conducting, uses, for workplace investigations, a card $4\frac{1}{2}$ x 7 in. upon which is logically arranged a complete list of the usual health-hazards of industry. By a simple code each is opinionated as "good," "fair" or "bad."

[3] See "Compensation for Industrial Diseases," by E. T. H. Lawes, 1909, Stevens and Sons, London, 306 pp. Also, "Order Extending the Workmen's Compensation Act," Great Britain and Ireland, Bull. Int. Labour Office, 1914, Vol. IX, Nos. 1, 2, pp. 23–24. Also, "Compensation for Occupational Diseases," Ontario, Canada, U. S. P. H. Reports, Aug. 21, 1914, Vol. XXIX, No. 34, p. 2176.

[4] In this connection we may say that the powers of the State Factory Inspection Department, limited as they are to the reports of factory physicians only and then to a certain few poisonous industries, do not permit of aggressive investigations of this sort.

[5] See Bull. Ill. State Dept. of Fact. Inspection, Oct., 1913, and April, 1914, I, 1 and 2.

[6] Several excellent textbooks have recently appeared upon occupational diseases and industrial or vocational hygiene which discuss the various hazards of each calling.

[7] See Symposium on Ventilation, Jr. Indus. and Eng. Chem., March, 1914.

STATISTICAL TREATMENT OF DEATHS OF "NON-RESIDENTS."

CRESSY L. WILBUR, M. D.,
Director of Vital Statistics, State Department of Health, Albany, N. Y.

Read before the Section of Vital Statistics, American Public Health Association, Jacksonville, Fla., November 30–December 4, 1914.

A VAST deal of nonsense has been written on the subject of deaths of nonresidents, chiefly by those who, being utterly ignorant or unscrupulous as to proper statistical methods, are concerned chiefly with the "reduction"—and then the further "reduction"—of their city death-rate so that their claim to dwell in "the healthiest city in the United States" may seem to have some basis of statistical foundation.

Such "authorities" sometimes resort to wholesome elimination of deaths at certain ages or from certain causes and then do not hesitate to compare the juggled figures with the rates for other localities in which the total deaths are employed in accordance with the Rules of Statistical Practice adopted by the American Public Health Association and approved by the United States Bureau of the Census.

It is rare indeed to find that any attempt is made to add deaths of residents occurring elsewhere, although it is very evident that the "nonresidents" deducted must be accounted for somewhere, under any reasonable system of vital statistics; otherwise the attempt at correction simply amounts to an understatement of the death-rate. And unless there is general agreement as to what shall constitute a "nonresident"—and we have not yet reached such agreement—it is evident that many more deaths of this class might be deducted in one city than in another, thus destroying entirely the comparability of the data.

The practical difficulties attending the allocation of nonresident deaths, and the unfair use that will be made of such data unless equitable and precise rules can be framed and followed by all registration offices alike, should not prevent our giving immediate practical attention to the correct treatment of these cases. It would be unwise, however, to undertake an immediate revolution in methods. The settled and thoroughly accepted basis of compilation, namely, the inclusion of all deaths that occur in any given area in the computation of its death-rate, will necessarily remain—at least for some time to come—the only feasible basis for general comparisons. A very considerable portion of our country—in which I am sorry to be obliged to include the state of Florida—is not even yet within the registration area. Deaths of residents of Jacksonville, for example, occurring in the rural part of the state, might not be registered. Exact statistical bookkeeping demands thorough and complete registration of every birth and death that occurs in every state of the Union. And then, and we may cite the example of England and Wales, with an efficient vital statistics law covering the entire country since 1837, it was not found feasible to procure the complete distribution of nonresident births and deaths until as recently as 1911. Contrast the clamor raised by those, chiefly from localities with utterly worthless or at least woefully deficient registration, *demanding*, perhaps by Act of Congress—as if Congress had ever taken any real interest in vital statistics—that "deaths of nonresidents shall be deducted."

A vast mass of useful mortality statistics has been accumulated by the Census and the registration states in which the total deaths that occurred are taken as the basis of comparison. The Census statistics are undoubtedly trustworthy for the great majority of areas, although undoubtedly an occasional injustice may be done when the balance of immigration is far in favor of the special locality. This would be offset, to some extent, by the unusually favorable age distribution that frequently obtains. Too much reliance, it should be always remembered, should not be placed upon crude death-rates in any case. They are necessary, but chiefly as an indication for further analysis. Hence to exclude "nonresident" deaths, with failure to add deaths of residents that occur elsewhere, and with no allowance for peculiar age constitution of population, may lead to such absurd rates as 5, 6, or 7 per 1,000.

The United States, as we all know, has been far behind the remainder of the civilized world with respect to the registration of vital statistics. It would seem that we might perhaps be content, until we have achieved general and complete registration of vital events throughout the country. with the methods that have thus far appeared practicable. But the present year, in the course of which vital statistics laws have been passed by South Carolina and Georgia, marks the close of what we may consider the first and formative period of American vital statistics. Every state in the Union now has a law of some kind—some of the kinds are wholly bad, unfortunately—for this purpose. We can now improve our laws and develop a higher standard of accomplishment thereunder. So it may be a good time to begin with the separation of nonresident deaths.

For this purpose it is necessary to have exact rules, which should be adopted and enforced as are other Rules of Statistics Practice of this Association. Referring to my discussion of this subject in the Census report on Mortality Statistics, 1912, pp. 13–15, and to the practice of the English Registrar-General's office as cited therein, I venture to suggest, as a basis for discussion:

Proposed Rule No. (a).—A separate compilation shall be made of deaths of nonresidents, corresponding to the main tables of total deaths, so that comparisons can be made and special rates, exclusive of deaths of nonresidents, can be computed. All such tables and rates shall plainly state that they are exclusive of nonresidents.

Proposed Rule No. (b).—Deaths of nonresidents ("transferable deaths") are deaths of persons who, *having a fixed or usual residence in the [State or United States]*, die in a district other than that in which they resided. The deaths of persons without fixed or usual residence [definite statement of "Former or usual residence" on Standard Certificate], *e. g.* casuals, are not transferable deaths [*Omit:* "except as provided below, (h)," namely, that deaths from violence shall be transferred (a) to district of residence; (b) if residence unknown or no fixed abode, to district where accident occurred; (c) failing this, to district where death occurred; (d) failing this, to district where body was found].

Proposed Rule No. (c).—The basis of distinction of nonresident shall be the (correct and truthful) replies to Items 17 (Cause of death and *Duration*) and 18 (Length of Residence) of the United States Standard Certificate of Death. No deaths of "nonresidents" shall be segregated by city, state, or federal offices in which the data required upon *both* of these items have not been filled out. State registrars should require local registrars to insist that these items be given in full for all nonresidents and advise them that otherwise no exclusions of such deaths will be made.

Note.—The wording of the Standard Certificate in Item 18 is sometimes misunderstood. "At place of death" is frequently interpreted as time at the hospital for residence of the city. Hence I have added, in the latest edition of the New York State death certificates, the explanatory underline "Primary registration district." Doctor Gram of Buffalo asks for Item 18 in all cases, residents as well as nonresidents; this practice is to be commended.

Proposed Rule No. (d.)—Persons dying in institutions for the sick and infirm, such as hospitals, lunatic asylums, workhouses, and nursing homes (but not almshouses) [and almshouses], must be regarded as residents of the district in which they had a fixed or usual residence at the time of admission [commitment]. If the person dying in an institution had no fixed residence at the time of admission, the death is not transferable [not to be included in tables of nonresidents]. If the patient has been directly transferred from one such institution to another, the death is transferable to the district of residence at the time of admission to the *first* institution.

Proposed Rule No. (e).—Deaths of residents of a city in an institution (*e. g.*, almshouse, nursing home, tuberculosis farm) situated outside of the city limits, but chiefly or entirely occupied by commitments from the city, should be included in the total deaths of the city; such deaths should be distributed by the city registrar to the districts of residence as provided by Rule No. 12 adopted in 1908.

Proposed Rule No. (f).—The deaths of infants born and dying within a year of birth in an institution to which the mother was admitted for her confinement should be referred to the district of fixed or usual residence of the parent (mother).

Proposed Rule No. (g).—Births in lying-in institutions shall be transferable to the place of fixed or usual abode, if known, of the mother.

Proposed Rule No. (h).—Deaths from violence are to be referred:

(a) To the district of residence, under the general rule;

(b) If this district is unknown, or the deceased had no fixed abode, to the district where the accident occurred, if known.

(c) Failing this, to the district where death occurred, if known; and

(d) Failing this, to the district where the body was found.

The proposed rules (a to h) are not entirely consistent in themselves, but are presented with a view to bring out discussion and, by a process of elimination, to reduce them to their lowest terms in the way of a practical working basis. A point to be considered is how far such rules will be applicable to the national statistics, with the large proportion of nonregistration territory, and to what additional degree, if any, deaths that occur with a state area can be distributed.

No apology need be made for the presentation of the English rules with a view to their possible adoption. Much more attention has been given in that country to these details of statistical administration than in this, and it would evidently be very desirable that the general methods should be closely in agreement. In neither country, however, has sufficient attention been paid to the requirement of a definite statement of duration of illness, dating from the original onset of the disease. If this information shall be attainable in a large proportion of cases, as contemplated in proposed Rule (b), a simple rule would perhaps prove effective:

Proposed Rule No. (i).—Nonresidents (transferable deaths) are deaths, including those in institutions, in which "Former or usual residence" is given under Item 18 as *other* than the "Place of death" (Item 1), and for which the "length of residence" is stated at is *less* than the duration of the (preferred) cause of death as stated under Item 17.

Whether a definite conclusion be reached at this meeting of the Association or not, I hope, with the approval of the special committee in charge of this subject, to make a practical trial of what seems—after full discussion—to be the most feasible method of treatment; without, however, disturbing the comparability of the data compiled and presented in the State and Census reports for preceding years. For this purpose I have prepared a card which will enable the exact place of residence, as well as of death, to be punched in considerable detail; and plan to punch duplicate cards for all nonresident and institutional deaths so that subsidiary tables can be built up without disturbing the main compilations, which must be based, for the immediate present, upon the well-established and generally sound basis of all deaths that occur.

THE INTERNATIONAL JOINT COMMISSION'S INVESTIGATION OF SEWAGE POLLUTION OF BOUNDARY WATERS.

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Commissioner of Health, Commonwealth of Massachusetts.

Read before the Laboratory Section, American Public Health Association, Jacksonville, Fla., November 30–December 4, 1914.

THE following questions regarding the pollution of boundary waters were referred by the governments of the United States and Canada to the International Joint Commission for investigation and report.

1. To what extent and by what causes and by what localities have the boundary waters between the United States and Canada been polluted so as to be injurious to the public health and unfit for domestic or other uses?

2. In what way or manner, whether by the construction and operation of suitable drainage canals or plants at convenient points or otherwise, is it possible and advisable to remedy or prevent the pollution of these waters, and by what means and arrangement can the proper construction or operation of remedial or preventive works, or a system or method of rendering these waters sanitary or suitable for domestic or other uses, be best secured and maintained in order to ensure the adequate protection of development of all interests involved on both sides of the boundary, and to fulfil the obligations undertaken in Article IV of the waterways treaty of January 11, 1909, between the United States and Great Britain, in which it is agreed that the waters therein defined as boundary waters and waters flowing across the boundary shall not be polluted on either side to the injury of health or property on the other?

The field work of the Commission aimed to secure data indicating the source, extent and degree of pollution of these waters in such a manner as to enable the Commission to answer the first of the two foregoing questions.

The field investigation covered the examination of the waters of Rainy River, parts of Rainy Lake and Lake of the Woods, that part of Lake Superior known as Thunder Bay, the St. Mary's River from the headwaters in Lake Superior to Mud Lake (including a set of samples through Detour Passage to Mackinac Island), Lower Lake Huron, the St. Clair River, Lake St. Clair, the Detroit River, the western end of Lake Erie, the central portions of Lake Erie (Port Stanley), the eastern end of Lake Erie, the Niagara River, the western portion of Lake Ontario, the eastern end of Lake Ontario, the St. Lawrence River to Cornwall, and that portion of the St. John River in which is the international boundary between the United States and Canada.

SCHEDULE OF WORK PERFORMED.

Date 1913.	Laboratory.	Waterway.	Headquarters.	No. of sample points	Total number samples
July 8–22	Provincial Board of Health, Ontario.	Rainy River.	Fort Frances, Ont.	192	955
July 28. August 15.	" "	Lake Superior (Thunder Bay).	Port Arthur, Ont.	66	922
June 28–July 16.	" "	Lake Superior St. Mary's River.	Sault Ste. Marie, Mich.	104	1,065
July 29. August 25.	" "	Lake Huron, St. Clair, River.	Sarnia, Ont.	142	1,606
September–October 10.	" "	Lake St. Clair, Detroit River.	Windsor, Ont.	174	1,755
September-October 3.	" "	Detroit River, Lake Erie.	Amherstburg, Ont.	114	1,306
October.	" "	Lake Erie, Port Stanley.	Windsor, Ont.	51	214
May 26–June 17.	" "	Lake Erie, Niagara River.	Fort Erie, Ont.	133	1,375
May 27–June 12–	" "	Niagara River.	Niagara-on-the-Lake, Ont.	59	840
April 10–May 23.	" "	Lake Ontario, St. Lawrence River.	Kingston, Ont.	113	928
May 23–August 27.	United States Public Health Service.	St. Clair River, Lake St. Clair, Detroit River, Lake Erie.	Detroit, Mich.	70	1,812
June 12. July 23.	" "	Lake Erie.	U. S. Revenue Cutter *Morrill*	20	480
May 12–July 19–	" "	Lake Erie, Niagara River.	Buffalo, N. Y.	60	1,624
August.	" "	Lake Ontario, St. Lawrence River.	Clayton, N. Y.	32	482
October.	" "	St. John River.	Van Buren, Me.	32	672
July 3–August 13.	Michigan State Board of Health.	Lake Huron, St. Clair River.	Port Huron, Mich.	45	720
August 1–August 21.	New York State Department of Health.	Niagara River, Lake Ontario.	Youngstown, N. Y.	42	338
August.	Provincial Board of Health, Quebec.	St. Lawrence River.	Montreal, Quebec.	8	480

The results of the field work are now in print.*

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* Progress Report, International Joint Commission in re The Pollution of Boundary Waters, 1914, Washington, D. C.

METHODS AND APPARATUS.

In a work of such magnitude large incubators were necessary. Modified or adapted chicken incubators costing about $38 were used. They were satisfactory for field work, and a saving of about $200 per incubator was effected.

Several types of deep sampling apparatus were used. The American laboratories used the following: A wooden bottle holder with strong clamps for holding the sample bottle was equipped with a heavy weight and stout rope. This was sunk to the required depth by the rope. The glass stopper could be drawn out one-half inch, permitting the bottle to fill by pulling on a smaller rope. The apparatus for raising the stopper consisted of two prongs fitting under the flange of the stopper attached to a brass rod running perpendicularly in a groove on the bottle holder. The rod was raised by a pull on the smaller rope, and a spring reseated the bottle stopper. The ground-glass stopper ordinarily seated itself one inch in the wide mouth of the bottle. A "stop" on the brass rod prevented raising the stopper more than ½ inch, so that while ample room for filling the bottle was provided, the stopper could not leave the bottle and by reason of the spring must reseat itself upon releasing the small rope.

INDICES OF POLLUTION.

Since *B. coli* is absent from unpolluted water, the estimation of this organism is therefore the most specific and best index available for showing the existence and degree of sewage pollution. The bacterial count at 37 degrees C. on agar is nearly specific for intestinal organisms whose optimum growing temperature is that of the human body. The bacterial count at 18 degrees–22 degrees C. is less specific in an investigation to determine sewage pollution, but is valuable nevertheless.

SCOPE AND TECHNIQUE OF EXAMINATION.

Samples were taken in wide-mouth glass-stoppered bottles which had been wrapped in paper and sterilized by dry heat at a temperature of not less than 160 degrees C. for one hour. Samples were immediately placed in containers and surrounded by ice. Although icing of the sample may have been unnecessary in some instances, it was deemed wise to make no exceptions and to use ice in transporting samples even when the time of transit to the laboratory was less than two hours.

At a conference in Detroit, it was agreed to use the presumptive test for *B. coli* in lactose bile, and where possible, confirmation tests on Endo plates. By the use of Endo plates the American laboratories were able to show that the index of error using bile media alone is small in the Great Lakes, and that the procedure in the Ontario laboratories of recording *B. coli* from gas production in lactose bile was safe and satisfactory so far as the Great Lakes water was concerned.

Experience on the St. John River, however, shows that until something is known of the flora in the water of a given stream it is unsafe to depend upon the presumptive test alone.

In addition it was agreed to make a count of the total bacteria on agar at 37 degrees C., and whenever possible on agar at 22 degrees C.

It was agreed that the *B. coli* content should be estimated by making dilutions and planting in lactose bile such quantities as 50 cc., 25 cc., 10 cc., 1. cc., .1 cc., .01 cc., and .001 cc., or as many of these as necessary to show both a positive and negative result. The inoculated lactose bile fermentation tubes were incubated for 48 hours at 37 degrees C. The bacterial count was an acutal count of the entire plate, such dilutions being made as to give not more than 200 colonies per plate. The combination of gas in lactose bile and a colon-like colony on the Endo plate, for the purpose of this examination were recorded with a plus sign. The media used and technique of examination was according to the standard methods of the American Public Health Association (Second edition, 1912).

Presentation of Data.

The presentation of the data obtained during this investigation involved the preparation of maps showing the location of the various sampling points, the detailed tabulation showing for each sampling point the average bacterial count per cubic centimetre on agar, *B. coli* per 100 cc. by Phelps method,* the number of samples collected, dates of collection, maximums obtained during the period of examination at each point and some illustrations showing graphically the source, degree and extent of the pollution as indicated by the bacterial findings.

In a work involving the examination of 20,000 samples of water in a period of six months the question of how far to carry the colon test becomes very important. Is the index of error in depending upon the presumptive test in lactose bile alone sufficient to warrant the expenditure of time and labor necessary to carry out the further steps in the complete identification of *B. coli?* We found that in locations where fresh sewage was discharged rather constantly the index of error in using the presumptive test alone was small. Supplementing the presumptive test by plating from the fermentation tube on Endo's media still further reduced the index of error. With a field laboratory examining from 30 to 60 samples daily it is impracticable to carry out the further steps in the identification of *B. coli* without reducing enormously the number of samples examined. Where the samples to be examined are few it is my opinion that the *B. colon* test should be carried out to the limit. In large operations, however, where the maximum number of samples in a minimum of time is required, the waste of time, labor and material necessary to eliminate the small index of error is not justified and it is poor judgment to carry the test beyond the confirmatory test on Endo's plates. I have always believed that this confirmatory control of the presumptive test is essential and our experience on the St. John River confirms this view.

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* Phelps, Earle B. A method for calculating the number of *B. coli* from the results of dilution tests. Reports and papers of the American Public Health Association, Vol. 33, 1907, pt. 2, pp. 9-13. Note: This method was most convenient for the purposes of the report.

FERMENTATION OF LACTOSE BILE BY AN ANÆROBIC ORGANISM.

In the course of the work on the St. John River an interesting finding was recorded. In the first two or three days of sampling it was evident that the number of organisms producing gas in lactose biles was out of proportion considering the lack of urban pollution (sewage). The tests of tubes showing gas were made on Endo plates and 305 out of 444, or 69 per cent., failed to show colonies which bore any resemblance to the *Colon Bacillus.* Transplants from the lactose bile tubes showing gas always gave on agar slants an ærobic surface growth and a production of gas along the sides of the tube below the surface suggesting an anærobe. The surface growth was sometimes a coccus, sometimes *B. subtilis*, and sometimes other ærobic organisms.

If the mixed culture of an agar plant was inoculated into hot agar and *B. subtilis* or other resistant organism accompanied the anærobe, the result was a surface growth of *B. subtilis* and a production of gas bubbles in the depths of the media. Pure culture of this anærobe can be obtained from the mixed culture by making dilutions and finally drawing the hot agar up in a long glass pipette. The bubbles form at intervals, and after selecting one apparently discrete, the glass is broken under sterile precautions and inoculation made from the walls of the bubble. Morphologically it is a spore bearing anærobe resembling and possibly identical with *B. Welchii.* It gave the typical reaction of *B. Welchii* in rabbits. Further work will show whether the two organisms are identical or merely related.

The question arises, Whence comes this considerable pollution with an organism resembling *B. Welchii?* It has been asserted that this organism is the only one outside of the colon group which ferments lactose bile, and that it is derived from the intestines of animals. We found nothing to suggest that the first statement is untrue, but the second statement, in our opinion, is open to question. More work will have to be done to show whether the intestine of man or animals is the habitat of *B. Welchii* or that their presence there is accidental. If its habitat is the soil, the question at once arises, Does it reach the soil from the manure spread over the fields?

The experience clearly shows that the presumptive test (gas in lactose bile) alone for *B. coli*, may be misleading and that some confirmatory test is necessary in certain waters. In this work Endo plates were used to confirm presence of *B. coli* in tubes showing gas.

It is very probable that a group of anærobic organisms of which *B. Welchii* is a type is much more widely distributed in our surface waters than is generally supposed. Where sewage pollution is gross the finding of *B. coli* is conclusive and obscures the presence of other factors in the gas production. If material from the gas tubes were transplanted into hot agar it is probable that in many instances this anærobe would be found.

PHYSICAL EXAMINATION OF EMPLOYEES ENGAGED IN THE MANUFACTURE OF PORTLAND CEMENT.

George E. Tucker, M. D.,
Riverside, California.

Read before the Section of Vital Statistics, American Public Health Association, Jacksonville, Fla., November 30–December 4, 1914.

IN THE past, investigation of the effect of cement dust on workers in cement mills has been apparently neglected, and there are few published references or documents concerning this field of industrial hygiene. Therefore, as a preface to this paper, I wish to briefly call your attention to the history of the industry, to give you a very limited description of the process of manufacture, and to quote briefly from the main authorities who have published their observations concerning the cement industry.

The form of cement which is now generally used is called Portland cement and was first sold in the open market of the United States in 1892, but for many years prior, a product known as natural or Rosedale cement was used for building purposes.

The first Portland cement plants were crude in construction as compared with the modern mills. The buildings, bins, elevators and casings were of wood and the cracking and shrinking of the material allowed the fine cement dust to escape in every direction. Now iron and steel have been largely substituted, with a resulting dimunition of the escaping dust.

Portland cement is made from materials which differ widely in outward appearances but are practically the same from the standpoint of chemical analysis.

A typical analysis of the raw mix, or crude material which enters into the composition of cement would be as follows:

Silica	15.18
Iron alumina oxide	5.06
Calcium carbonate	76.34
Magnesium carbonate	2.90
Undetermined	.52

While a finished cement shows the following analysis:

Silica	22.98
Iron alumina oxide	8.80
Lime	63.10
Magnesium oxide	2.42
Sulphuric anhydride	1.42
Loss on ignition	.52
Undetermined	.69

On the Pacific coast the cement mills use a high grade lime rock, which is reduced to the proper proportions with a clay material, consisting almost entirely of silica, iron and alumina. These materials are quarried in the usual way and brought into the mill, pass through gyratory crushers which reduce them in size to three inches and under. From this point they are passed through rotary dryers to drive off any excess moisture before grinding.

The grinding process then reduces the size so that 94 to 96 per cent. of the material will pass through a 100 mesh sieve before burning.

This material is then carried to the kilns where it is burned to the point of incipient fusion, at a temperature of about 1200 to 1500 degrees centigrade, the resulting masses being known as "clinker."

The clinker is carried outside of the mill by means of conveyors, where it is allowed to cool or age, is later brought back into the mill and approximately 3 per cent. of gypsum is added. The addition of this gypsum is merely to regulate the setting time of the cement. This material, ground again through the same type of mill, produces the finished product. Cement is so finely ground that 95 to 97 per cent. will pass a 100 mesh sieve and 80 to 84 per cent. pass a 200 mesh sieve. It is then stored in bins from which it is drawn and conveyed to the packing department and packed by automatic machinery.

It will be noted that from the beginning of the process of the manufacture until the finished product is completed, dust is the end desired.

Referring now to published reports, one eminent writer has said that "in general, observations and statistical data go to show that exposure to mineral dust has health-injurious effects and such effects reveal themselves in the general high death-rate."

Nevertheless, cement as a mineral dust differs from others in this group inasmuch as cement dust is a finely ground, non-irritating powder and contains no grit or germs. It has the property of setting and forming a solid mass in the presence of moisture and because of this property very little, if any, of it reaches the lungs through the respiratory tract. "There are no irregular and jagged particles that might bring about irritation of the pulmonary mucous membranes and so predispose these delicate tissues to microbic attack. Nor can it be said that the dust is noxious by reason of its chemical properties."

In the annual report of the Chief Inspector of Factories for Great Britain, for 1911, Mr. Sidney Smith, H. M. Inspector for Dangerous Trades, stated that, "Careful inquiry has been made as to the effects of dust on the health of the workers. Sick clubs exist in a number of the factories and particulars as to mortality, invalidity and sick pay appear to show that the trade is on the whole a healthy one. Deaths are few, absences from work rare and generally due to influenza, colds or accidents, and sick pay is small.

There is often more invalidity among the workers in non-dusty processes than in the dusty occupations of kiln drawing, milling and packing."

A comparison of the death-rate among men employed in the several occupations in which there is more or less exposure to mineral dust, with the death-rate per thousand from all causes in all occupied males, shows that in the former the death-rate is 14.56 per cent., while in the latter it is 15.16 per cent. In England and Wales the mortality from consumption among men in occupations where there was exposure to mineral dust, was somewhat lower than for occupied males in general. Between the ages of 35 to 64, the death-rate among those employed with exposure to mineral dust was decidedly excessive.

The smallest percentage of deaths due to consumption in these dusty occupations, by groups, is in the group of occupations with exposure to vegetable fibre dust, and the second smallest percentage of deaths due to consumption is among men employed in occupations with exposure to mineral dust.

Unfortunately, in considering this high death-rate from consumption and other respiratory diseases, the subject of housing conditions among workmen and living conditions in general, had not been investigated and their influence is not revealed in these tables. Further, the report of the investigation does not indicate wherein ventilation and general insanitary conditions exist and their influence upon the death-rate. Writers of authority upon this subject emphasize the importance of adequate ventilation, and dust reduction, and the report of the English Departmental Committee, appointed to inquire into the ventilation of factories and workshops, published in 1902 and 1907, warrants the conclusion that "effective ventilation of factories and workshops and the artificial removal of dust at the point of origin is entirely practicable and possible at moderate expense."

Adequate ventilation in cement mills is carried out to an ideal degree, because of the fact that two sides, and oftentimes three, are nearly always open. Inasmuch as the modern kilns release no impurities, and since in no department is the occupation sedentary in character, there is no objection on the part of the employees to proper ventilation. In California, where moderate weather prevails the year round, the problem of ventilation is a minor one.

The greatest number of men employed in the industry are engaged in the quarrying of the raw material. Outside of the packing room and the sack cleaning room, there is no department in which cement dust escapes into the atmosphere in any appreciable quantities.

In the packing department, at the present time, a small number of men are required, and the use of the mechanical automatic type of packer reduces the quantity of cement dust which escapes into the atmosphere to a negligible minimum. The recent installation of a dust-proof sack cleaning machine in the Riverside plant has, to all intents and purposes, overcome the dust problem in this department.

Observations on the effects of cement dust in the past have been made where the old method of packing and cleaning was still in vogue.

A footnote reference made on page 711 of the Bulletin of the Bureau of Labor is here quoted:

"(a) How widely qualified opinions differ with regards to the health-injurious effects of mineral dust derived from lime and cement is made evident by the following quotation from the *Journal of the American Medical Association*, December 12, 1908:

" 'Selkirk has investigated a general opinion among lime workers that they are exceptionally free from bronchitis and pulmonary tuberculosis. He was unable to find an instance of phthisis among them, nor could he learn on inquiry, of any worker in limekilns having died from tuberculosis. He asks whether those who inhale and swallow much lime are abnormally free from tuberculosis of the lungs. He discusses what is known of the therapeutics of calcium salts, and says that it appears that the continued absorption of calcium from the lungs and intestines might maintain an abnormally high percentage of it in the blood. He suggests that the workingmen predisposed to tuberculosis might turn his attention to lime and cement working as an occupation, and even hints at the organization of lime works as a curative tuberculosis colony. A rapid increase of weight is commonly observed in new workers at the Warren Cement Works at Hartelpool.' "

And I would further quote: "Prof. K. B. Kehmann of Würzburg" and his associates, with a view to preventive and palliative measures to be applied to industries, have sought more precise information regarding the ways by which dust permeates the body, as well as the actual quantities which represent dangerous insanitary limits. These investigations have demonstrated that most inspired dust finds its way into the stomach, not into the lungs. Most of the dust which enters the upper respiratory tract is caught by the moist mucous membranes of the nose and throat, and the dust-laden secretion is then swallowed.

"In the case of insoluble particles the gastro-intestinal path may furnish a most satisfactory channel for the subsequent elimination of the dust from the body, but soluble dust finds a peculiarly favorable chance for absorption along the same route, and the opportunity for chronic intoxications is thus easily established. In any event, the lungs escape the major part of the initial irritation."

It would appear that since the principal ingredient of cement is lime in the form of calcium oxide, that undoubtedly this material would meet with the same fate in the stomach as lime water, and since a very great proportion of our infants have a very appreciable quantity of lime water added to their diet without injurious effects, it would be desirable to know by what line of reasoning calcium oxide from cement would have a different effect from calcium oxide from lime water. The hydrochloric acid of the stomach would undoubtedly be able to convert the oxide into the chloride and this material can be ingested in large quantities over long periods of time apparently without ill effects.

Laboratory tests show that 99.7 per cent. of $^5/_{10}$ of a gram of cement is soluble in 500 cc. of a $^1/_{10}$ per cent. solution of hydrochloric acid, and 99.7 per cent. of $^5/_{10}$ gram of cement is soluble in 250 cc. of a $^2/_{10}$ per cent. solution. The average per cent. of hydrochloric acid varies from $^1/_{10}$ to $^2/_{10}$ per cent. in the gastric juices of the normal stomach.

Similar experiments conducted in the laboratory, using the so-called treater dust, or dust which escapes from the stacks of the kilns heated to 800 degrees centigrade showed that 81.44 per cent. of $^5/_{10}$ of a gram was soluble in 100 cc. of a $^1/_{10}$ per cent. solution of hydrochloric acid. This solution became neutral when reaction was complete.

The partially burned, or treater dust, however, is not present in the dusty parts of the mill, and its effect should not be considered because of its absence from the various departments.

If the limited amount of dust which escapes in the packing and sacking departments in these modern mills is sufficient to cause deleterious effects upon the respiratory organs of the men employed, it would seem by analogy with the effects in other dusty trades, that the hospital records of these various mills would show an unusual number of cases of pulmonary tuberculosis.

However, the hospital records of the various mills do not present any evidences of tuberculosis having been acquired by employees and an investigation of four of the largest county hospitals located in the vicinities of the various plants, namely, San Francisco, Sacramento, Los Angeles and San Bernardino, conducted in March 1913, showed that of 471 patients in the tuberculosis hospital at San Francisco, including a list of those who had been discharged and those who had died, only three of this number gave as occupation, cement worker.

The occupation of cement worker was among those forming less than 1 per cent.

From a total of 955 cases investigated in the Sacramento County Hospital, there were no patients giving occupation as cement worker.

In the Los Angeles County Hospital, of 1,449 cases of tuberculosis investigated, 9 patients gave their occupation as cement workers and the occupation of cement worker was among those forming less than 1 per cent.

The San Bernardino County Hospital records, including the years from 1891 to 1913, representing a total of 722 cases, showed that there were no patients giving their occupation as that of cement worker, although there is a large cement mill located in the county about three miles distant from the hospital.

In a letter from Mr. Frederick L. Hoffman, Statistician for the Prudential Life Insurance Company, to Dr. W. F. Snow, former Secretary of the California State Board of Health, Mr. Hoffman stated: "The evidence of medical men," referring to the investigation of the effects of dust in the cement plants, "and others, is generally negative. Pulmonary complaints, phthisis and asthma, appear to be conspicuously absent. There is no evidence of life being shortened, but on the contrary, the longevity of cement workers is remarkable, men being frequently found at work at the age of 60 years and upwards."

Mr. Hoffman further stated that "The inhalation of dust must cause a great deal of discomfort and probably the injurious effects on the system are greater than are at present recognized."

It has been thought that since the investigation of tuberculosis hospitals and the medical evidence has shown that cement workers were comparatively free from pulmonary tuberculosis that it might be possible to determine to what extent they suffered from nasal and pathological throat conditions as a result of employment in departments where there was more or less of cement dust, and with that in mind, Dr. W. E. Stevens, a nose and throat specialist of San Francisco, made an examination of eighty men, a chosen twenty from each of four mills. "The factors in the selection of subjects were the length of time employed and the department of work."

"The departments where the workers encounter the greatest quantity of dust are the grinding mill, the packing or sack house, and the sack cleaning house. The majority were selected from these departments from among men who had been employed in cement work for four years or more."

The findings in general were that in 85 per cent. there was a deposit of cement dust in varying quantities fairly uniformly located on the middle portion of the septum and anterior ends of the middle turbinates. The dust was easily removed showing a normal membrane except in three cases, in two of which there was a small superficial ulcer of the septum and in one a large perforation of the septum, apparently of long standing.

In 20 per cent. there were deflected septa.

In 5 per cent. enlarged tonsils.

In 5 per cent. a slight catarrhal inflammation of the larynx.

In 28 per cent. a slight inflammation of the naso-pharynx, with an excessive catarrhal secretion.

In 40 per cent. a catarrhal inflammation of the pharynx.

"The conclusions from the examination were that the membrane of the nose seems to exercise its complete function and eliminate the dust from the inhaled air. The cement dust being practically sterile and chemically non-irritating, there is very little inflammation caused by its presence in the nose.

"It is fair to state here that catarrhal inflammation of the throat is very prevalent on this coast, and a large per cent. of people will show an inflammation of the throat with an excessive secretion.

"Almost all the men were asked if they had any symptoms referable to the nose or throat. In two instances there had been a sore throat, otherwise they had no subjective symptoms.

"The average time of employment in cement manufacture was four and one-half years. The length of time employed apparently had no influence on the conditions found, as the foregoing detailed report will show."

During the year three experiments with guinea pigs have been conducted in the Riverside Plant, one of which is not as yet completed.

Twelve pigs were exposed continuously to dust for a period of three weeks, night and day.

Six pigs were kept as a control outside the plant.

The result of the autopsy of these 18 guinea pigs was negative. There were no concretions in the nose, throat, lungs or intestinal tract.

Later 10 guinea pigs were exposed to dust in two departments of the mill on shifts, two weeks twelve hours during the day and for two weeks twelve hours during the night, for a total period of four months.

Five pigs in one department gained 1,530 grams, or an average of 306 grams each.

Five pigs in another department gained 1,020 grams, or an average of 204 grams each.

Macroscopical and microscopical investigation of all the viscera of these pigs was negative. X-ray pictures of the pigs were negative.

Among the first pigs exposed two developed concretions over the cornea, completely filling the conjunctivas, holding the eyelids open. These concretions remained for twenty-four hours, when they disappeared without treatment, leaving perfectly normal corneas and conjunctivas.

Three groups of guinea pigs were exposed to dust in three different departments on working shift hours for two months. They were inoculated with known quantities of tubercle bacilli emulsion. The guinea pigs previously exposed were again placed in dusty departments of the plant for exposure during working hours and the rapidity of death and results of autopsies will be noted.

Eight guinea pigs unexposed to dust used as controls, were inoculated at the same time as the above and two of this number have already gone to autopsy.

In October 1913, the Riverside Portland Cement Company inaugurated a complete system of physical examination of all employees, with the view of making an investigation of effects of employment in the various departments of the industry upon the health of the men, and with the further purpose of reducing the accident hazard in the various departments by selection of risks.

The system in brief employed in the medical department consists of a complete physical examination of all employees and applicants for employment, annual reëxamination of employees, a complete medical record of all cases of illness occurring among the men and a similar record of all cases of injury from accidents. Applicants for employment must be examined prior to assignment to duty.

An employee, when ill, notifies his foreman, who sends him to the time office, where a slip giving age, number, department, length of time employed is written, a copy sent with the patient to the doctor for his record and a duplicate kept on file in the time office. Three physicians are available to the men for treatment, but the assignment is made to one of the staff.

Hospital cases are cared for in the city hospital, medical records, including physical examination and treatment, are recorded by the physician and upon recovery from illness, the employee is given a "return to work slip" signed by the physician. Such employee cannot return to work except upon the presentation of this slip.

The data which I now wish to present to this body has been gathered from the records of 1,500 physical examinations, covering a period of one year. Of this number 956 were employees and 544 applicants for employment.

Among the employees the total number classified was as follows:

First class	427	or 44.65 per cent.
Fair	364	or 38.07 per cent.
Doubtful	96	or 10.04 per cent.
Bad	69	or 7.20 per cent.

Among the applicants the classification of risks was as follows:

First class	330	or 60.66 per cent.
Fair	158	or 29.04 per cent.
Doubtful	14	or 2.59 per cent.
Bad	42	or 7.72 per cent.

Among the employees twenty-seven nationalities were represented, of which there were:

Mexicans	282
Americans	248
Armenians	223
Italians	63
Austrians	39
Hungarians	29

The Armenians showed the highest per cent. of married employees, the Americans the second highest and the Mexicans third.

Of the Armenians 115 stated that they used liquor in sufficient quantities to be worthy of mention, 108 used no liquor.

Of the Americans, but 54 of 248 admitted the use of liquor in any appreciable quantity, whereas,

188 Mexicans out of 282 admitted its use;

58 of 62 Italians used quantities of liquor, and

24 of 29 Hungarians,

35 of 39 Austrians.

Among the 956 employees examined there were 99 admission of gonorrhea, but five admitted having had syphilis. Of the cases of gonorrhea, there were;

42 Americans,

29 Mexicans,

2 Armenians.

There were 30 cases of hernia, or a ration of 1 to 50;

There were 64 cases of epitrochlear adenopathy, or a ratio of 1 to 23; 100 cases of enlarged tonsils, or a ratio of 1 to 15;

6 cases gave history of having had appendicitis;

There were 150 cases of faulty heart, or a ratio of 1 to 10;

15 cases of amputation of one or more fingers;

2 cases of amputation of toes;

12 cases of improper flexion and impaired function of joints;

8 cases of deformed fingers;

1 case of deformed forearm;

2 cases of deformed chest;

1 case of deformed elbow;

4 cases of deformed shoulder;

2 cases of deformed ankle;

Total ratio of deformities 1 to 33.

18 men were deaf in one ear;

13 partially deaf in both ears, or ration of 1 to 45.

214 of the total number of employees and applicants gave history of having had smallpox;

677 of having been successfully vaccinated, or nearly 50 per cent.

Of the employed men the following was the

Average age	31 yrs. 8 mos.
Average weight	$149^3/_4$ pounds.
Average height	5 ft. $6^1/_4$ in.

The table for average height and weight for 30 years of age in insurance tables indicates that for 5 ft. 6 in. the average weight is 145 pounds.

Among the applicants for employment the following was the

Average age	31 yrs. 6 mos.
Average weight	$149^{1}/_{6}$ pounds.
Average height	5 ft. 6 in.

It should be understood that the men called "employees" were not selected risks and underwent no physical examination prior to employment, nevertheless the average weight of employed men was the same as the average weight of the applicants for employment.

The average age of employees in packing house was 29 yrs. 4 mos. 23 ds.

The average weight	$153^{1}/_{3}$ pounds.
The average height	5 ft. $6^{1}/_{2}$ in.

The average weight of men employed in the packing department was about four pounds more than the average weight of all men employed. This is based on the examination of 73 men who had been employed an average of more than two years.

In the dusty parts of the mill figures show an

Average age of	31 yrs. 6 mos.
Average weight	162 pounds.
Average height	5 ft. $6^{3}/_{4}$ in.

This is an average weight 13 pounds more than general average, and is based upon the examination of 106 men employed for more than an average of two years.

The nationalities in the packing department were as follows:

Italians	22
Armenians	17
Austrians	14
Mexicans	9
Americans	8

The nationalities in the mill were as follows:

Italians	19
Armenians	22
Austrians	13
Mexicans	14
Americans	21
Hungarians	9

It should be noted that the ratio by nationalities in the mill is practically the same as the ratio of all employees. In the packing house, however, the larger number of Italians and the comparatively smaller number of Americans change the ratio somewhat.

Among the employees there were 16 cases of suspected tuberculosis and but two had worked in any dusty part of the mill. Their employment covered a period of 1 and 10 days respectively. The others had worked either in the quarry or yard, departments in which there could be no contact with cement dust, and the average length of employment was 4$^1/_2$ months. Seven applicants for employment had physical signs indicative of previous tuberculosis.

The average blood pressure among employed men in the sitting position, was—

	Systolic.	Diastolic.	Pulse.
Right arm	121.9	74.04	47.50
Left arm	122.75	75.93	46.82
Among applicants:			
Right arm	125.68	76.1	49.58
Left arm	125.88	76.2	49.68

Comparative blood pressures by age groups are available, but not included in this report because of previous detailed data.

The nineteenth session of the California State Legislature passed a Workmen's Compensation Act, and all the industries of the state have been operating since January 1, 1914, under the provisions of this Act. The hazard in connection with the manufacture of cement presumably is such as to warrant the Board of Insurance Underwriters to agree upon a rate of 5.7 per cent. of the payroll as a premium for a policy covering the risks in conformity to provisions of the present Workmen's Compensation Act. In our plant such a premium would amount to $2,736.00 a month. As a result of the installation of modern safety appliances, and an intense educational campaign, together with a selection of risks, the amount of compensation paid out to date for ten months and twenty-five days has amounted to $709.96, a result well worthy of mention.

The effect of the selection of risks on the reduction of accidents justifies the continuation of the physical examination and reëxamination of employees from both a humanitarian and financial standpoint.

A study of the hospital records for eleven months shows that there have been 539 cases of illness coming from an average monthly payroll of 671 men. The average loss of time from illness was less than two days and one-third of the cases were from among men employed in outdoor work in the quarries. One-sixth were from the mill and an almost equal number from the packing and sack-cleaning departments.

21.5 per cent. complained of digestive disturbances. 80 per cent. of these were diagnosed as constipation.

14.47 per cent. complained of colds.

14.47 per cent. neuralgia.

1.00 per cent. nasal disturbances.
4.00 per cent. eyes.
5.00 per cent. throat.

In conclusion, as a result of an investigation of the dust problem in conjunction with the manufacture of Portland cement, based upon the review of literature on the subject, the examination of 956 employees in one plant, examinations of men employed in the dusty departments of four other mills, the medical records of employees and guinea pig experimentation, there appears to me to be no evidence of injurious effects from cement dust upon employees engaged in its manufacture. The reëxamination of all employees and the continuation of the records will give us information of more value, and annual reports of the results of the work at the Riverside Portland Cement Plant will be available to any one interested in this most important phase of the cement industry.

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THE USE OF COMPLEMENT FIXATION REACTIONS IN A PUBLIC HEALTH DIAGNOSTIC LABORATORY.

A. McNeil, M. D.,
New York City Department of Health.

Read before the Laboratory Section, American Public Health Association, Jacksonville, Fla., November 30-December 4, 1914.

THE application of the complement fixation test to the routine work that comes within the scope of a Health Department Diagnostic Laboratory, has been found reliable only in the diagnosis of syphilis, gonorrheal affections, and glanders. Much research work is being carried on, however, to make this test available in the diagnosis of streptococcal and various other bacterial affections, but at the present time, the wide discrepancies in the results obtained have made it impractical for routine work excepting in the three diseases previously mentioned.

Experience has shown that in the preparation of bacterial antigens no one method is applicable to all varieties of organisms, but each separate group of bacteria seems to require a different method of procedure to produce a successful antigen.

The composition and reaction of the culture medium used in growing bacteria for the preparation of antigens is a matter of the utmost importance. Experimental work would seem to show that antigens of much greater specificity may be obtained from cultures that have been grown on laboratory media for a considerable period of time, than from recently isolated cultures. In complement fixation tests as performed in the New York City Department of Health Serological Laboratory, the proportions of the various reagents used in the original Wassermann test have been adhered to, but the total amount of the contents of each tube has been reduced from 5 ccm. to .5 ccm. This modification makes it possible to perform the tests with a very small amount of serum and also materially reduces the running expenses of the laboratory without in any way interfering with the accuracy of the tests.

The New York City Health Department Laboratory saves several thousand dollars a year on guinea pigs alone by using this modification.

The anti-sheep hæmolytic system and serum inactivated at 56°C. for thirty minutes are used in all complement fixation tests. The same technique is used in the application of the test to the diagnosis of syphilis, gonorrhea and glanders.

Comparative tests have shown that a considerable increase in the number of positive results may be obtained by fixing complement at ice-box temperature instead of the usual 37°C. In the syphilis tests 4 hours at ice-box temperature is the optimum period, while in the tests for gonorrhea and glanders 6 hours gives the best results. This modification does not render the tests too sensitive. In the complement fixation test for gonorrhea, comparative tests between the fixing of complement at ice-box temperature and at 37°C. were made on the bloods of 466 inmates of a state reformatory for women. The ice-box method showed a considerable increase in the number of positive results over fixation at 37°C. As practically all of these women were prostitutes, the total of 65 per cent. of positive results obtained does not seem too high. Vaginal smears were also made from all of these women, only five of which were positive.

In glanders a considerable increase in the number of positive results is obtained with ice-box fixation. This increase is largely confined to cases of farcy, which are frequently missed when fixation at 37°C. is used.

A very interesting series of comparative tests between ice-box fixation of complement and fixation at 37° in the glanders test, was carried out by immunizing eight healthy horses with glanders vaccine. The blood of these horses by fixation at 37°C. was strongly positive for 8 weeks, becoming negative in about 12 weeks, while with the ice-box fixation they continued to give strongly positive results for 14 weeks, becoming negative in about 16 weeks.

At the same time it was ascertained that the blood of horses injected subcutaneously with mallein will react positively for a period of six weeks. Therefore this test is useless where horses have recently been malleined or injected with vaccines.

The antigen used in the syphilis test is a crude alcoholic extract of guinea pig's heart, while in the gonorrhea and glanders tests aquæous extracts that have been passed through a Berkefeld filter are used.

To ensure accuracy all complement fixation tests are made in sets of twelve, each set having a complete series of controls, and each test being performed in duplicate.

All reagents used are carefully titrated and standardized every morning before commencing tests.

Since the Serological Laboratory of the New York City Board of Health was officially established on May 1, 1912, following a resolution making venereal diseases reportable, 55,891 blood specimens have been tested for syphilis, giving 20,279 positive, 27,038 negative, and 8,574 doubtful results.

These specimens have been received from more than three thousand physicians, from city and state penal institutions and from hospitals and dispensaries.

At the present time blood specimens to be tested for syphilis are being received at the Laboratory at the rate of about 2,000 a week or over 100,000 a year.

Since May 1, 1912, 11,672 specimens of blood have been tested for gonorrhea, giving 2,274 positive, 5,675 negative, and 3,723 doubtful results.

As long as gonorrhea is confined to anterior urethra in males or to the vagina in adult females, positive results are never obtained, but shortly after the posterior urethra in the male or the cervix in the female becomes infected, positive results may be obtained.

The test becomes negative in about six to eight weeks after a cure has been effected.

Since May 1, 1912, 9,351 specimens of horse blood have been tested for glanders, giving 1,570 positive, 4,401 negative, and 3,380 doubtful results.

Positive results are obtained very early in this disease and complete fixation of complement means that gross lesions will almost invariably be found on autopsy.

After having made over 75,000 complement fixation tests since the Serological Laboratory was established, it seems safe to assume that in a properly performed test, using freshly standardized reagents, that while a negative result does not exclude the possibility of infection, a positive result may be accepted as evidence of infection.

A doubtful reaction in the syphilis test is without significance excepting in old treated and in very recent cases. In gonorrheal and glanders tests doubtful reactions should be considered as negatives, excepting in glanders where horses are known to have been exposed. A single negative result should never be taken as final where the slightest suspicion of infection exists.

Book Reviews.

American Sewerage Practice. *By Leonard Metcalf and Harrison P. Eddy. Vol. I, Design of Sewers, pp. X–747 illustrated, $5.00. Vol. II, Construction of Sewers, pp. X–564, illustrated, $4.00. McGraw-Hill Book Co., New York and London, 1914–1915.*

The appearance of the first two volumes of Metcalf & Eddy's "American Sewerage Practice" (to be completed in a third volume on The Disposal of Sewage) marks an event in American engineering literature. The prominence of the authors in that branch of engineering which they represent, and the extensive labor of preparation suggested at once by the size of these volumes, assures the reader, in advance, of a work of more than usual interest. Careful perusal of these thirteen hundred pages, moreover, gives evidence that this space has been needed for the proper presentation of the subject and that there has been gathered together in these volumes a digest of material which, in extent, detail and manner of presentation, has never before been equalled in an American work upon this subject.

The first volume on the Design of Sewers, after an introductory historical chapter and a chapter on the general arrangement of sewerage systems, takes up in turn and in logical sequence, the various factors entering into design. The chapters on hydraulics are especially well done and comprise in short space a clear discussion of a difficult topic. Questions of quantity of sewage, precipitation and storm flows are treated fully and satisfactorily. When practices diverge, the authors broadly present the various methods of solution and are noticeably free from dogmatic statements, although attempting to harmonize these variations whenever possible. The remainder of the volume deals with actual design, from the strength of sewer pipe to the analysis of masonry arches and from catch basins and ventilation to pumping stations.

The second volume on construction is equally detailed and draws even more largely upon the experience of the authors. The contractor no less than the construction engineer will find here much that is of permanent value both as to methods and to costs. From preliminary borings and engineering organization, through excavation, sheeting and trenching, and construction of pipe, brick and concrete sewers, down to operation, maintenance and costs, nothing seems have been overlooked. Excavation problems receive especial attention and the treatment is especially detailed, even down to a discussion of the shape and treatment of drill bits. Specimen contract, specification and cost sheets are given and the final chapter deals with explosives and gasoline traps. The authors express their debt to their junior partners and staff for assistance in the preparation of this work.

True to its title it is a compendium of the best American sewerage practice, carefully analyzed in the light of a broad personal experience and illustrated by practical examples carefully worked out and explained. The incompetent engineer will miss the comforting *ipse dixit* of the school text-book, but the student will find the best material prepared here for his use together with all the assistance that any author could give him to work out his particular problem to a sound conclusion.

Earle B. Phelps,
Washington, D. C.

How to Diagnose Smallpox. *By W. McC. Wanklyn. Longmans Green & Co., New York and London.*

The brevity of this book is not the least of its merits. It is a practical little volume, which should prove of value to physicians whose personal experiences have been limited to the more severe types of smallpox that formerly prevailed, as well as to physicians without any personal experience whatsoever in the diagnosis of this disease. Much information contained in it is not found in the ordinary text-book or treatise on the practice of medicine, and it is just such information as the practitioner needs to help him in a doubtful case, especially when expert advice is not at hand. The writer well emphasizes the importance of mild cases and the difficulty of diagnosing them. The points of differentiation stated by him are probably as safe guides as can be found outside of actual personal experience or the assistance of one who has had such experience.

This book can be highly commended to those whose official duties or private professional work makes it incumbent upon them promptly and certainly to recognize cases of smallpox.

Wm. C. Woodward, M. D.

A Survey of Industrial Health-Hazards and Occupational Diseases in Ohio. (*Columbus, Ohio, State Board of Health, 1915, pp. 438; 101; Illustrations.*)

This is a most instructive and interesting account of an investigation authorized by the legislature of Ohio to determine the causes and conditions of illness and disease among employees in various trades and occupations in Ohio. The investigation was conducted for the State Board of Health by Dr. Emery R. Hayhurst with nine principal investigators.

The report designates the chief industries and processes and defines the principles of the study of their effect upon health. It does not touch upon industrial accidents or their prevention.

The especial feature of the report is the declaration and definition by Doctor Hayhurst of about a dozen so-called "health hazards" applicable to all the industries. Hayhurst points out the fact that it is the business of the factory inspector to connect these health hazards with disease and deaths. "The misconception of the ability of persons to become accustomed to health hazards," he says, "is responsible for a large percentage of the preventable sickness and mortality, *e. g.*, tuberculosis, cancer, rheumatism, anemia, alcoholism, nervous diseases, organic heart disease, circulatory diseases, lung diseases other than tuberculosis, Bright's disease, skin diseases and external causes." "In Ohio in 1912 over 1/6 of all deaths were due to circulatory diseases and 1/8 of all deaths to organic heart disease alone. As a cause of death tuberculosis has been almost doubly outstripped by these chronic degenerative diseases, 58 per cent. of which have occurred before 70 years of age, and 20 per cent. of which have occurred before50 years of age." The list of industrial health hazards comprises dust, dirt, dampness, darkness, devitalizing air, temperature, fatigue, inactivity, infections and poisons.

The investigation disclosed some twelve hundred cases of positive occupational diseases or disabilities, including cases of lead poisoning, brass chills, skin affections, benzine and benzole poisoning, and tuberculosis.

An important constructive feature of the report is a description under each process of the corrective measures designed to meet the hazardous conditions.

Doctor Hayhurst is to be congratulated for his insistence upon the point that accepted standards should be defined and adopted for all industrial processes and conditions in order to give a definite relationship between the generally recognized health-hazards and all diseases or disabilities.

The index contains special lists covering the forms of occupational dusts, complaints, diseases and poisons reported as hazards.

The report includes a chapter on lead poisoning by the author; one on the Standardization of a method for the Detection of Lead in the Urine, by Charles R. Parkinson; and one by the author and Professor Ernest Scott on Four Cases of Sudden Death in a Silo.

The report is stimulating and helpful to persons interested in furthering the study of the prevention of occupational diseases and injurious influences, and its valuable and unique features place it among the scholarly monographs and works on the subject.

Wm. C. Hanson, M. D.

Health Department Reports and Notes.

REPORTS

Brockton, Massachusetts.

The annual report for 1914 of the city health department of Brockton, Mass., states that this city with a population of 65,286 has maintained for years the lowest infant mortality rate of all Massachusetts cities and has recently been made the subject of a detailed survey by the Children's Bureau of the United States Department of Labor.

The good points of the report are numerous: the population statistics are complete and show the basis of the estimates made; the financial statement is well subdivided and detailed enough to give an accurate idea of the relative costs of the various phases of the department's activities; the tables given are simple and easy to interpret; the illustrations are adequate and well chosen. The cut showing the plan of the municipal laboratory, which is one of the best in the state, is unique and interesting.

According to the Massachusetts system the Health Department appropriation proper and that for contagious diseases are separated. $28.724 was spent for the former and $14.956 for the latter. The School Inspection Department has done good work but more adequate inspection is planned for next year, if possible there will be one doctor for each school each morning. Compulsory vaccination of all school children who do not have a certificate of immunity from a competent physician is rigidly enforced.

During the past year $2.00 has been charged for each Wasserman test, but the laboratory advises that the work be placed upon a free basis for the coming year in order that more use may be made of this valuable reaction.

A clean milk contest has been run during the past year, and an illustration of the dairy maintaining the lowest bacterial count is shown. The equipment is very simple and illustrates the now well recognized fact that it is not necessary for a dairy to have a high score to produce a high grade milk. The record maintained by the winner was an average count of less than 10,000 bacteria per cc. for the entire year.

The vital statistics given in the report are excellent.

NOTES.

An Unique Lunch Room.—The Department of Health of New York City has opened an educational lunch room for its employees at the headquarters of the Department. The object of this is primarily to provide a wholesome luncheon at cost price; secondarily, we expect to educate the patrons in the subject of food and nutrition. It is realized, of course, that such education can only progress slowly. The subject, however, will undoubtedly be much more keenly grasped by the objective teaching of the lunch room than in any other way. The enterprise is being financed by the employees themselves and the city is put to no expense in its maintenance.

At the opening of this lunch room on Monday, May 10, there were present the acting Mayor, Hon. George McAneny, Borough President Marcus M. Marks, Professor Graham Lusk and other distinguished guests.

The following specimen lunches furnishing balanced ration are taken from the unique menu.

LOW COST.

BALANCED RATION.

	Price. Cents.	*Quantity.*	*Calorics.*	*Protein gms.*
Cream of asparagus soup. .	5	½ pint	230	7.0
Salade a la Santé.	8	Av. helping	370	2.0
Glass of milk	4	7 oz.	160	7.0
Apple pie.	5	⅙ pie	300	4.0 or
With cheese		1 cu in.	390	8.0
Whole wheat bread		2 slices	140	5.5
*Butter.		½ oz.	120	—
	22		1320 or	25.5 or
			1410	33.5

HIGH COST.

Balanced Ration.

	Price. Cents.	*Quantity.*	*Calories.*	*Protein gms.*
Cream of asparagus soup...	5	½ pint	230	7.0
Roast beef...............	20	4 oz. lean	140	30.0 or
with		4 oz. fat	460	27.0
Mashed potatoes, creamed		Av. helping	150	4.0
String beans.............	5	2 h. tbsp.	10	.5
Salade a la Santé.........	8	Av. helping	370	2.0
Apple pie.................	5	⅙ pie	300	4.0
Black coffee...	3	1 cup	——	——
Sugar....................		2 sqs.	60	——
Whole wheat bread.......		2 slices	140	5.5
*Butter..................		½ oz.	120	——
	—		——	——
	46		1520 or 1840	53.0 or 50.0

*Butter made from pasteurized milk.

⁂

Plague, a National Menace.—A most admirable article appears in No. 20 of the Public Health Reports for the current year—in which Assistant Surgeon-General W. C. Rucker maps out the present geographical distribution of plague, points out the routes over which the country may expect plague and applies logically the knowledge gained in the recent experience at New Orleans and other American ports.

There are four lines of defense according to the author:

1. Marine quarantine and disinfection of ships.
2. The prevention of the embarkation and disembarkation of rodents at wharves.
3. The immunization of human beings against plague.
4. Rat proofing the environment in which man works and lives.

The first three defenses are either impracticable or unreliable—and the conclusion is reached that the last is more feasible and less expensive than is commonly supposed.

⁂

Prevalence of Syphilis.—That practically 10 per cent. of the entire adult population of New York City would give a positive Wasserman reaction is the conclusion reached by Dr. Horace Greeley of the New York City Health Department in a study on "Syphilis as a Public Health Menace." in the March monthly *Bulletin*.

His estimate is based (1) on the recorded Wasserman tests in the City Serological Laboratory—which have increased amazingly during the last few years, due to the fact that the number of physicians using the laboratory for diagnosis—and (2) on tests made at various penal institutions and on applicants for license to peddle from push carts.

He mentions the notorious inaccuracy of the recorded mortality rates from syphilis, and cites the fact that many deaths from this disease are recorded under such designations as arteriosclerosis, aneurism, chronic heart disease, chronic liver disease, chronic kidney disease, locomotor ataxia and paresis.

"It would be more in accordance with the facts"—he thinks, "to regard syphilitic infection as responsible for one point in our present death-rate of 14."

Whether one accepts Doctor Greeley's conclusions as true or not, the table which follows is worthy of notice:

New York Serological Laboratory

Positive Wasserman Tests.

1912 (May to Dec. 31)..............	1,547
1913................................	7,602
1914................................	13,870

⁂

Favors Flexner Serum.—A short note in the May number of *Public Health*—the official organ of the Society of Medical Officers of Health, London—tells of the relative efficacy of the various anti-meningococcic sera, obtainable in England. The article gives statistics which decidedly favor that put out by the New York City Board of Health and known as the Flexner and Joblin serum.

Of the five preparations listed, the American made product gave apparently very superior results and the author concludes "that in all cases of cerebro-spinal fever an anti-meningococcic serum should be used, also that the antiserum of Flexner and Joblin should receive an adequate trial."

⁂

Patrons as Inspectors.—The central idea of a note from the Cincinnati *Weekly Report* for May 1, is worthy of wide advertisement.

"During last week the department had its attention directed to conditions in a number of bakeshops, which illustrate the necessity for continuous inspection of this industry.

"No bakeshop inspections have been made for a period of three months, practically the entire sanitary force having been engaged in sanitary surveys of newly annexed territory for the purpose of ordering sewer connections, the installation of inside closets and the elimination of outside vaults.

"The lack of bakeshop inspection was noticeable on reinspection of some of these places and conditions found which, if not speedily remedied, will result in owners being cited to appear before the Board of Health.

"One man was found mixing dough with dirty hands and arms and was compelled to scrub himself thoroughly before being allowed to proceed with his work.

"Patrons of bakeshops can become an irresistible force for cleanliness in these places and of the employees by making personal inspections.

"Clean shops employing clean methods and clean employees will welcome such inspection, while dirty ones will resent it."

⁂

Personal Hygiene.—That health departments are more and more entering the field of personal hygiene is evident. It is encouraging as well as novel to read in the New Haven (Conn.) *Health Bulletin* the following article on a subject which is very distinctly in the domain of personal hygiene—that undeveloped branch of health conservation.

"As summer approaches, the days are likely to be warm and the nights cold and the air may vary much in temperature from day to day. While in the sun it may be warm, in drafts it is more than likely to be chilly. As most people are still wearing the same clothes as in winter, slight exertion produces an uncomfortable heat and often profuse perspiration, and if the exertion is continued, the outer garments are probably removed. Under these conditions one does not realize that the air is cool or that he may be in a chilly draft and when he stops he neglects to protect himself by proper covers. Again, at this time of the year, the ground is often damp and always cold. At leisure moments, especially if the sun is warm and enervating, one is apt to sit or lie upon the ground. On warm days the heavy clothing of winter is uncomfortable and sometimes annoying and people are prone to forget the chilly nights and the sudden changes of temperature from day to day and hasten to change their thick underclothes for those of a much lighter and cooler weight.

"We wish to call attention to the prevalence of colds during the early spring months. Authorities profess to believe that drafts and sudden changes of temperature do not produce colds, but persons to catch cold must be exposed to some of the specific bacteria. Yet they admit that these conditions are predisposing causes and as predisposing causes they are dangerous. We also call attention to the impropriety of changing thick underclothing for light, until the temperature has become settled. Even if heavy clothes next to the skin are annoying, we believe a light weight should not be adopted until near the first of June. We advise against drafts, especially when overheated, sitting or lying upon the ground, or wearing thin underclothing until the likelihood of hot days and cold nights and sudden changes is passed.

"Common colds are never fatal, but their complications or after effects may be very serious. It is of course impossible to estimate the extent of the danger done by colds, but if the theory that colds are contagious is correct, and the complications are many, it is not improbable that the indirect damage to human life is very great. It is therefore our duty to the public as well as to ourselves to protect ourselves from all predisposing causes."

⁂

Typhoid Vaccination Campaigns.—North Carolina has the highest typhoid death-rate of any state in the Union according to Dr. W. A. Evans. Its rate is 57.4 per 100,000. However, improvement may be expected soon for, as a result of the active work the State Board of Health, a vigorous anti-typhoid campaign will soon begin in five counties of that state.

"The first five counties in the state to hold coöperative anti-typhoid campaigns with the State Board of Health have just been selected. They are Wake, Northhampton, Cumberland, Henderson and Buncombe. These were the first counties to volunteer active, vigorous cooperation in the matter. Wake County heads the list with an appropriation of $500; Northhampton is second with $400; Cumberland third with $350; Buncombe and Henderson follow with $300 each. This money will be used to pay in part the salaries and traveling expenses of the physicians in charge. The State Board of Health will furnish free anti-typhoid vaccine, literature, placards, posters, and a traveling anti-typhoid exhibit, together with exhibit material on flies, and other public health subjects. These campaigns will start in all five counties on June 21.

"It is expected, from the results obtained in previous years, that 5,000 people or more in each of these counties will avail themselves of this free opportunity to protect themselves against typhoid. This in turn will greatly reduce the typhoid rate in these counties."—*News Bulletin.*

*

Administration of Child Welfare Work.—In a report recently submitted to the town council of Sunderland, England, Dr. H. Renney outlines the work done there to reduce infant mortality. The work was begun in 1904 and for the five years preceding the average infantile mortality was 165 per one thousand births, for the five years following it was 138 and for the last five years, 133. At three different centers "Mother's Welcomes" were established where much educational work was accomplished in regard to infant management and feeding. Health visitors undertook the supervision of midwives, the instruction of expectant mothers, and the visitation of infants during the first year of life. Attention is drawn to the fact that in this work something should be done for the children between the ages of one and five years. The senior health visitor in this work acts as superintendent of midwives for the bureau giving lectures to them in the evenings. Besides this she makes 1,800 visits per year; each of the other five health visitors makes 4,600, or 16 visits per working day. This scheme provides for the division of the bureau into six districts with a maternity and health visitor for each; the health visitor is to attend at the center once a week to give practical advice on maternity and infant hygiene, visit the children in her district under five years of age, cases of tuberculosis, measles, whooping-cough, and chicken-pox. The visitation of expectant mothers will be an important part of her duties.—*The Medical Officer,* May 1.

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Pennsylvania's Progress.—Dr. Samuel G. Dixon has been reappointed Commissioner of Health of the Commonwealth of Pennsylvania.

This is Doctor Dixon's fourth appointment to this position and within a few days he will have completed ten years of service in this office.

Under his direction the Pennsylvania Department of Health has achieved a high place among the public health organizations in this country and the work which has been accomplished has attracted attention at home and abroad.

At the present time the Department has between three and four thousand employees and its activities reach to every section of the state.

In the campaign against tuberculosis, which ten years ago was the chief cause of death in Pennsylvania, one hundred and fifteen tuberculosis dispensaries have been established and three great state sanatoria have been constructed. In ten years tuberculosis has fallen from first to second place as a cause of death in this state and the rate is steadily declining year by year.

Four thousand deaths and forty thousand illnesses from typhoid fever was the annual toll exacted from Pennsylvania's citizens ten years ago. Today this has been decreased more than 75 per cent. and although in the meantime the population of the state has increased more than a million, the number of deaths from this cause is only one-fourth the former figure.

During the past year the death-rate of 13.9 per thousand inhabitants was the lowest in the history of the state. More than seventy-eight thousand people are alive in Pennsylvania today who would have died had the death-rate of 1906 continued. Of these 78,916 lives, 40.528 have been saved by the reduction of four principal diseases.

Typhoid fever	18,865
Tuberculosis	11,924
Diphtheria	4,648
Whooping-cough	4,091

During these years 1,767,000 babies have been born in Pennsylvania whose births have been recorded, with all the facts concerning them, in the Bureau of Vital Statistics of the Department of Health.

Since its establishment the Pennsylvania Department has served as a model for numerous other states that have desired to profit by the methods which have been here inaugurated.

The General Assembly of Pennsylvania appropriated $4,632,387.00 for public health work in Pennsylvania during the next two years. Of this amount, $2.975,807.00 was for tuberculosis work.

Public Health Notes.

Typhoid Fever in the United States in 1914.—*The Journal of the American Medical Association* publishes, in the issue for April 17, its third annual summary of typhoid fever in the large cities of this country. "It is evident from the data given," says *The Journal*, "that typhoid fever is on the way to become a relatively rare disease in many parts of the United States. There are two main reasons for this: 1. There are now comparatively few large cities in which the public water supply is likely to contain typhoid bacteria in dangerous number either constantly or occasionally. 2. The increase in the practice of pasteurization has resulted in a dimunition in the amount of milk-borne typhoid. With these two great sources of infection largely removed, health officers are in a position to begin a detailed study of less generalized sources. Outbreaks due to carriers and other causes can be much more readily discovered when they are no longer screened by a mass of cases due to water or milk. The really astonishing decrease in typhoid fever since 1910, which amounts to a reduction of about 20,000 cases annually in a population of 23,000,000, is a matter for national congratulation. It is not too much to hope that by 1920 nearly all large American cities will have reduced their typhoid rates to a level fairly comparable with that maintained for some years past in Berlin and London."

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Insurance Experience and Lengthened Life.—Forty-three of the leading insurance companies in the United States and Canada agreed in 1909 to prepare their collective experiences on many different classes of insured such as (1) those engaged in hazardous occupations, (2) those with a family history of consumption, (3) those with a defect in their personal history like syphilis (4) those with intemperate habits, and (5) those who were distinctly overweight or underweight. Statistics were compiled concerning two million lives, showing in what classes mortality was above the average and the approximate number of years by which the average lifetime would be reduced.

The statistics regarding hazardous occupations showed that among locomotive engineers the mortality was 60 per cent. in excess of that experienced among the insured as a whole which is equivalent to five years' reduction in the average lifetime. It is interesting to note in this connection that a "safety first" campaign inaugurated by one of the largest railroads has reduced the number of deaths among employees one-third since its inauguration.

The mortality among working miners in underground metal mines was more than double that among other insured men. This means an average reduction of nine years in their lifetime. As pneumonia and tuberculosis are among the principal causes of death here, personal hygiene may reduce this rate.

A high mortality exists among men engaged in the liquor business. That of saloon keepers is 70 per cent. above the normal, that of men connected with breweries is one-third above the normal.

Among people with a history of syphilis only those showing partial or complete recovery were taken as a rule and yet among these people there was an extra mortality of 80 per cent. causing a decrease of about six years in the average lifetime. These figures correspond with those made by German and Scandinavian companies.

The class of men who admit they had taken alcohol occasionally to excess, but having satisfactory habits showed an extra mortality or 50 per cent. or a reduction of four years in the average life. Men using alcohol more frequently made even a worse showing. Upon this basis a loss of five hundred thousand men by Russia in the present war would be made good in ten years through complete abstinence from alcoholic beverages.

Statistics show that tuberculosis frequently follows an attack of pleurisy. Among men who had a parent die of tuberculosis, mortality was high at the younger ages but normal at the older ages.

Among men forty pounds above the average weight at the age of 45, the lifetime was but four years less than of men of normal weight, diabetes, Bright's disease, heart disease and apoplexy causing a large proportion of the deaths.

These statistics of the Medico-Actuarial Mortality Investigation were compiled with no intent to prove a theory but merely to ascertain the facts. Consequently they are unprejudiced and reliable.—Mr. Arthur Hunter, *Chairman*, Central Bureau Medico-Actuarial Mortality Investigation, in the *Public Health Journal*, May, 1915.

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New Training for Women in Health Work.—With the increase in our knowledge of microbiology, sanitation, and hygiene and the growing interest in public and personal health, the nurse's horizon has been greatly extended and the lines of her work have been multiplied. The new trend is to prevent illness rather than to cure it. The bedside attention given by the visiting nurse in the past has not been sufficient to meet the requirements. The want has therefore been felt for a training supplementary to that acquired in the hospital training schools which will socialize the nurse and equip her for the important rôle she should play in the community health campaign.

With this purpose in mind, the Boston Instructive District Nursing Association, together with Simmons College and the School for Social Workers, has organized an eight months' course for graduate nurses. The work at Simmons includes Bacteriology, Biology, and Epidemology of Infectious Diseases, Municipal and Industrial Sanitation, Nutrition, and Food, and Education. The social sciences and preventive nursing are given by lectures, conferences, and by actual contact with the field problems afforded by the excellent facilities of the School for Social Workers and the Nursing Association. The nurse goes out as an educator, able to teach the doctrine of cleanliness and as a coöperator, rather than as an assistant to the physician and the public health officials.

Another unique training inaugurated at Simmons College is that for a scientific secretary. This is a four-year program which aims first of all to give a thorough scientific training and secondly, to give sufficient work in the secretarial department to make an expert stenographer and office assistant. As private medical-secretary she should prove indispensable to the busy practitioner, and to hospitals, being able to handle correspondence, keep the case records and do other office work, besides assisting in making urine, blood, sputum, and other analyses. To the research department in institutions, the scientific secretary's familiarity with scientific terminology and literature will round out her assistant work in the laboratory.

These courses are described in the new Simmons College catalogue and in special bulletins sent out by the Instructive District Nursing Association and the School for Social Workers of Boston.—C. M. H.

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Technique of Typhus Disinfection.—"A typhus technique outlined by Doctors Letulle and Bordas that is adapted to the temporary military hospital gives the essentials of treatment. The customary separation of patients into groups on entering such an institution gives opportunity for affording special quarters and special treatment for the typhus patients. These are kept by themselves till cleansed, and there is little risk of cross infection so long as they are not permitted to leave infected quarters save under precautions of cleanliness and dress. The entrants must be disinfected, and on account of the minuteness of the pest this must be thorough, and the admission house must have its special apparatus. On examination it is determined at once whether the patient is carrying parasites.

"A special little group of rooms is necessary for thorough disinfection. The floors are of cement and the walls of impermeable plaster. A barber shop and bathroom are the first essentials, and next a hospital cot on wheels with mattress covered with smooth waterproof stuff. There is an incinerator, for wastes, for none of the creatures are permitted to live a moment, but are cremated on the spot. Then there should be the usual cabinet of disinfected tools and another of towels, together with sets of uniforms for the physicians. These are in a green impermeable cloth. There is a pair of sack pantaloons which enclose the slippers and has no opening save at the waistband, which, however, finds itself at the armpits and is here tightly closed by means of a draw-string. There is next a vest of the same cloth with neck and wrists with drawstrings and a cord girdle at the true waist. Additional precautions may include packings of absorbent cotton at neck and wrist and a cotton cap. These will protect the assistant from parasites.

"When he takes off his clothing the patient himself drops them into a metallic box and upon them there is poured a quantity of benzine or chloroform, the former the most effective, and the box tightly closed. This then goes into a disinfecting-room, the benzine being fatal to the insect. The patient is then shaved both on face and head and the hair drops upon a paper which goes instantly to the furnace. Next there comes the bath, which is somewhat alkaline and a rinsing with javelle water, after which, in clean clothing, the patient is directed toward the place in the hospital assigned to him. It may be anywhere, for he is no longer dangerous. In case of individuals who cannot bathe, compresses moistened with benzine are placed near them in different positions, the fumes of which will be fatal to the pests. In case there are wounds which will prevent the removal of the hair, the patient goes to an isolation room where a treatment with benzine disposes of the insects, but he is kept there so as to be sure that he is not dangerous.

"One can see from this how the principle of entrance house of a hospital for infections, which has its infected side and its safe side separated by bathrooms and disinfectors, can handle typhus where it is not really indigenous. In the quarantine station of an American port, for example, this may be done, but in a country that like Serbia is infected with the insect to an extent that no one really knows, the problem may be quite different, for the cleansed men who survive might be merely turned back into a general reservoir of infection from which they can protect themselves only by some such means as inoculative prophylaxis. The vaccine of Plotz, which is claimed to be a preventive of typhus, is yet much too new a science for a dependence in a grave situation, but Serbia will surely give an admirable case for its testing. And, meanwhile, American sanitarians will be at work heading a movement for the hygienic uplift of the whole country."—Clinic, *Boston Transcript*, May 12.

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Distribution and Habitat of the Tetanus Bacillus.—*The Journal of Infants' Diseases*, March, 1915, published an article by Willis Noble of the Sheffield Scientific School giving the results of his experiments with horses, cows and guinea pigs in an investigation upon the habitat of the above-mentioned organisms. The results of his work are expressed in the following summary:

"The tetanus bacillus appears in the intestines of many normal animals especially the herbivora, but apparently it seems impossible, with the methods at our disposal, to detect it there unless it is present in relatively large numbers. Experimental evidence shows that the tetanus bacillus may multiply in the intestines of such animals. The intestines, or rather the intestinal contents of certain individual animals, seem to offer especially valuable conditions for the growth of the tetanus bacillus; such animals are 'tetanus carriers' comparable in regard to the distribution of the organism, with typhoid carriers among human beings. The presence of tetanus spores in soils, street dust, fresh vegetables and on clothing and the skin is undoubtedly due to fecal contamination."

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"Live a Little Longer," The Rochester Plan.—In speaking before a meeting of life insurance presidents, Miss M. E. Bingeman outlined the plan of the Rochester, N. Y., Board of Education to improve public health. Two teachers, one doctor and one nurse, were engaged to give lessons bearing directly on health and life conservation. Classes (to membership in which women eighteen years old and over are eligible) are taught in the public school buildings between four and five in the afternoon. Information is given concerning what diseases are preventable, how to avoid them, how the body can be made resistant to disease, how to nurse scientifically, how to reserve, record and report symptoms, and what to do in emergencies. The care of children, preparation of food, and child teaching are also discussed. The course consists of twelve lessons, two a week for six weeks, and is successively given in different localities. It is desirable that a class should include from twenty to fifty people.

Interest in the movement was secured through the coöperation of the Ministerial Association, the Chamber of Commerce, the Woman's Educational and Industrial Union and the Life Underwriters Association. The hearty coöperation of the insurance companies in circularizing their policyholders was of great value and brought immediate results.

The article sets forth the need of public education in health matters and makes an appeal for a general application to this sort of a plan.—*The Public Health Journal*, April, 1915.

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Glanders in New York City.—During the past five years, 5,803 horses have died from glanders in New York City. This means a money loss of over a million dollars. The disease is caused by the bacillus mallei, discovered by Löffler and Schütz in 1882. It is spread by contact, inhalation, through skin abrasions, by infected harness and food and, perhaps most frequently of all, by means of public drinking trough and blacksmith shops. In diagnosing the disease the New York Department of Health has employed the complement-fixation test, the technic of which is similar to that of the Wasserman reaction. Although man is susceptible to the disease it is impossible to estimate the number of cases of human glanders on account of the difficulty attending diagnosis.—*New York Medical Journal*, April 10.

✥

Use of Iodine in the War Zone.—The following quotation is from a letter by Doctor Hamilton to the *Medical Record* of January 23, 1915:

"The use of iodine seems to be most general just at this time, and the French government furnishes each soldier with a small packet containing an ampule with a small brush. An English pharmacist has improved this by supplying an ampule filled with a strong tincture, the friable stem of which ends in a pledget of gauze or cotton. When the wounded man breaks the terminal stem, the bandage is soaked with the contents, and with this he thoroughly swabs the wound. It is said to be far more efficacious than the simple application of gauze, which is said to favor the retention of an imprisoned bacteria. This is on the theory that in anaërobic wounds the dangerous bacteria of tetanus, gangrene, malignant edema, and other diseases thrive in situations when air is excluded; in fact, after the first application of iodine there is little or no dressing applied. In many cases the wound heals by first intention."

✥

Typhoid Fever Among the English Troops.—Captain Harry Morel, of the Canadian Army Medical Corps, who is now in charge of the inoculation depot at Tidworth Barracks, England, speaks most highly of the benefits derived from anti-typhoid inoculation. It seems remarkable that the sick rate of the English troops is only three per cent., indeed lower than in some of the home garrisons. This is due largely to the absence of typhoid fever. In the Boer war more men died of typhoid fever than of other diseases combined; this disease caused more deaths than bullets. Nearly all of the soldiers engaged in the present campaign have been inoculated and not a single man protected by inoculation has died of typhoid fever.

"Of the 421 cases of typhoid in the present campaign among British troops, 305 cases were in men who were not inoculated within two years. In the 421 cases there have been 35 deaths. Of these deaths, 34 were men who had not been inoculated within two years. Only one death occurred among patients who were inoculated, and that man had only been inoculated once, instead of the proper number of times—namely, twice.

"From all these favorable reports it is quite likely that inoculation against typhoid fever will be made compulsory in the British as it has been in the United States army since 1910."—*Public Health Journal*, May, 1915.

✥

Are Unvaccinated Persons a Danger to the Community?—Dr. C. K. Millard, in the March *Journal* of the Royal Sanitary Institute, asserts that although unvaccinated people are in greater personal danger they are not a great source of danger to the community because of the fact that successful prevention of smallpox depends upon prompt recognition and proper isolation and care of the disease. Thus cases among vaccinated people which often escape prompt recognition may tend to spread the disease more than cases among unvaccinated. It cannot be denied, however, that the existence of a large unvaccinated population must add to the seriousness of an epidemic. Thus a partially vaccinated community is exposed to a peculiar danger.

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Administrative Control of Diphtheria.—The present tendency is for more attention to be paid to the "carrier" as one of the chief factors in spreading this disease. The question naturally arises then, Where may the carriers be best looked for? Recent statistics dealing with a fairly large number of cases show that throat or nose swabs from both home contacts and school contacts reveal three times as many positives among the former as among the latter. Moreover, clinical nasal diphtheria is at times apparently more infectious than the pharyngeal form.

Accordingly, contacts in the home and at school, especially cases of mild sore throat, should be subjected to laboratory examination and a careful examination should be made during convalescence as the infection may persist after weeks of isolation. Graham Smith makes the point that the bacillus is of slower growth in these last mentioned cases and the cultures have to be incubated for a longer period than usual.

Some interesting statistics comparing English towns which have hospital isolation for diphtheria with those which do not has shown that the latter have a lower case rate than the former. This may be explained by the fact that where isolation is practised the usual custom is to disinfect the house after the removal of the patient and then, after a short period of quarantine, to allow the contacts to return to school or to public life, while in the other case all contacts remain in quarantine. This apparent advantage on the part of towns without hospital isolation is offset by their higher case mortality.—*Journal Royal Sanitary Institute*, March, 1915.

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Letter from Servia.—*The New York Medical Journal*, May 15, prints a letter from J. Rudis-Jicinsky which we quote in part:

"Typhus fever or exanthematic typhus came in its acute form, infectious, febrile, and highly contagious. The invasion of this epidemic was sudden, with profound depression of the vital powers of all the patients, especially the prisoners of war, housed together in unclean places, overcrowded, unventilated, and under absolutely insanitary conditions, with a diet to which many were not accustomed. When the mortality in February went up to 80 per cent. at some places, when the physicians and surgeons, exhausted as they were in taking care of thousands of wounded, gave their first offerings upon the altar of humanity—we lost, here and in the vicinity, about eighty-nine of them—we had to think again, and selected a commission approved by the military authorities and the state, to find means to fight this enemy worse than bullets, grenades, shrapnel and bombs. We found that fear was a bad physician and cleanliness the best medicine.

"The hyperemia of the brain beginning abruptly with a chill, was followed by violent fever, the temperature within a few days reaching 38° to 40° R., according to their thermometers, or, according to ours, 104° to 105° F. The pulse was frequent and bounding, soon becoming small, weak, and rapid. We had to watch the cardiac impulse, the first sound being almost effaced in the majority of cases. Then severe headache followed and delirium, from the fifth to the seventh day. Beside the little wounds produced by the louse, we found usually on the chest of the patient, first, a coarse, red, diffused, measly eruption, with a mottling of the skin later all over the body, except the face, not disappearing on pressure. The face had a deep flush, the pupils were contracted, the eyes injected. We isolated the cases at once, disinfected our wards every day, especially the toilet rooms, covering all the beds with naphthalin and washing the bodies of the patients—all of them—with petroleum, whitewashed the rooms once a week, looking for absolute hygienic surroundings.

"We cleaned up our place—after one of our pavilions had burned down, the other day—telegraphed home for funds to Mr. J. W. Frothingham of New York, and now purpose to build up a sanitary field hospital or barracks, clean and new for the prisoners; pavilions for contagious diseases had already been erected by our English colleagues. In this way, we hope the typhus will be checked soon, and proper arrangements made to meet the cholera. At present, the death-rate being 45 per cent., we need funds, the articles named above—shirts, underwear, socks, shoes, slippers, disinfectors, medicine (quinine sulphate, digalen, strychnine, the iodides, iodoform, cocaine, chloroform, ether, morphine, chloral, bromides, etc.) and surgical material (cotton gauze, bandages, ligatures, silk, adhesive plaster, etc.)."

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The Problem of Proper Lighting.—Medical inspection of school children has made us aware of the existence of a large number of abnormal eyes among scholars from the earliest ages and shows us that the proper lighting of a school room is of primary importance. The minimum illumination on desks for ordinary clerical work is $2\frac{1}{2}$ to 3 foot candles. Reflections, the nature of the blackboard, of the chalk used, and the work to be done, is also of importance. Here, as in industrial establishments when artificial illumination is used, it should be even and in sufficient quantity but not of a monotonously uniform brightness. All good lighting should avoid flickerings, unshaded lights in direct vision, glare, excessive contrasts, insufficient illumination, dirty and wrong types of lamps, globes and reflectors and improperly placed sources of light. Even in shop windows care is taken to make the light fall upon the goods and not into the customers' eyes.—*Medical Officer*, April 24.

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Artificial Cultivation of Smallpox Virus.—Dr. Fr. Proescher has shown that the filterable virus of variola as well as that of rabies and of poliomyelitis is visible and may readily be stained by such aniline dyes as methylene azure. He states that he has recently succeeded in cultivating the variola-vaccine virus under anaërobic conditions. The classification of this organism is still in doubt. They are coccus-shaped bodies although their staining reaction resembles that of the protozoa rather more than that of the bacteria. The author concludes that the constant microscopical finding of these organisms in the specific lesions, their peculiar staining properties, the cultivation of a similar organism from the original and the production of typical changes with far distant sub-cultures in susceptible animals leaves no doubt as to the specific nature of the organism which he has succeeded in growing upon artificial media. It remains to be shown, however, whether the artificial cultures of these micro-organisms are able to produce an active immunity or give rise to antitoxic or bactericidal antibodies.—*Interstate Medical Journal*, May, 1915.

⁂

The Mode of Infection in Infantile Paralysis.—The belief that this disease is carried by the stable fly is general and is based wholly upon an imperfect experimental foundation which has now been largely disproved, according to Dr. Simon Flexner. It will be remembered that Dr. M. J. Rosenau announced in 1912 that he had succeeded in transferring experimental poliomyelitis from diseased to healthy monkeys through the medium of the stable fly. This experiment was confirmed soon after by Anderson and Frost but they, as well as many other investigators, have failed to repeat the experiment successfully since that time. It is difficult to explain these early experiments and it is certain that danger of infection from this source is slight.

The fact has since come to light that there are walking or ambulatory cases of poliomyelitis and the author brings evidence to show that the microbic agent of the disease is carried in the nasal and buccal secretions of persons, and communicated by them in such manner as to gain access to the upper respiratory mucous membranes of other persons who acquire the infection and develop the disease. This should not cause undue alarm, for the carriers are not more numerous in this disease than in many other infections of common occurrence.

The virus or microbic agent of epidemic poliomyelitis has been cultivated by Doctor Flexner and Doctor Noguchi. It consists of minute globular bodies capable of being distinctly viewed under a high power of the microscope.—*American Journal of Diseases of Children*, May, 1915.

⁂

Aseptic Nursing.—A good lesson in the importance of contact infections is given in a discussion of the methods employed in treating contagious diseases at St. Luke's Hospital, Jacksonville, Florida. The article referred to is written by L. J. Harris and appears in the April *Journal* of the Florida Medical Association.

At St. Luke's Hospital each patient in the contagious pavilion is placed in a cubicle or small room with walls of silicon plaster or glass. Each room is provided with a wash basin without any plug in it and levers operated by the elbows for turning on and off the water. The walls of the room are painted with an enamel finish that they may be easily washed and the doors are always left open. The room is also provided with hooks for the physicians' and nurses' gowns, individual paper toweling and everything necessary for constant use on the patient. In going on duty the nurse changes her dress, cap, apron and bib only, and in going off duty she removes her ward clothing first, washes hands and face and then puts on a uniform that has not been worn in the ward. No disinfectant is used for the hands, a thorough washing is found to be more practical and efficient. When the patient is discharged the linen in his room is sent to the laundry, the mattress and pillows to the steam sterilizers and the nursing articles are sterilized. The walls and furniture are washed with soap and water. Fumigation is never done. The result of thus laying the whole emphasis of danger upon contact infection has been that since 1904 the per cent. of cross infections has been less than 0.1.

⁂

Dairy Scores vs. Bacteria.—"In so far as the quality of milk can be determined by present laboratory methods," concludes James D. Brew in Bulletin No. 398 of the New York Agricultural Experiment Station, "there exists no relationship between the quality of milk and the dairy score on the score cards now in use. Milk of all grades, ranging from the finest quality to the poorest, is produced in barns which would be excluded on account of low scores. All grades of milk are likewise produced in high-scoring barns.

"The real explanation for this lack of relationship between the scores and the bacteria counts cannot be given as yet with absolute certainty. The most apparent reason, as shown by investigations made at this station, is that a large number of the items included on the score card have little or no effect upon the number of bacteria present in the milk. In other words, too great emphasis is placed upon unessential factors in all of the score cards studied, with a consequent lessened emphasis upon the factors which actually do affect the milk.

"Some may contend that these findings encourage the production of milk under filthy conditions. This contention will be raised only by those who hold the idea that low-scoring dairies are necessarily unsanitary and filthy. Such conditions have, however, not been found to hold true in the region studied because low-scoring dairies were found which vied in cleanliness with the most ideal of the high-scoring dairies. On the contrary, however, these facts give decided encouragement to the intelligent dairyman who finds that he can produce high-grade milk by the simple observation of the few essential factors of cleanliness and care. This places him in a position to secure a greater profit from his business while at the same time he has the moral satisfaction of knowing that he is selling a high-grade article. Where the present score cards are used, all dairies, in order to get credit for Grade A milk, are forced to an additional expense and consequently to an increased cost of production. At the same time a compliance with the score-card requirements carries with it no guarantee that the quantity of milk will be improved or rendered more safe from the standpoint of public health.

"The fact that high-grade milk can be produced with simple equipment, likewise gives encouragement to the consumer who is as much interested in keeping down the cost of producing high-grade milk as is the producer.

"None of the results secured in this investigation can be so construed as to disprove the value of dairy score cards, but they do show that present score cards cannot be satisfactorily used as a means of grading milk according to quality."

⁂

Smoke and Health.—While the soot from coal smoke has been found to have germicidal properties, the general effect of an undue amount of smoke in the atmosphere is harmful. These are the conclusions of Dr. W. L. Holman of the Pittsburgh Pathological Laboratories in an article giving an account of some studies along this line in the May number of the *Journal of the Outdoor Life.*

Coal smoke is made up of particles of incompletely burned coal and a number of gases arising from the combustion, which indicates a waste, since properly stoked fires do not smoke. These sooty particles floating in the air become the centers of tiny envelopes of water, formed by the condensation of the acqueous vapor of the atmosphere when the temperature falls. The more numerous the particles in the air under such conditions, the denser will be the fog or mist which they form, and when they become too heavy they fall as rain. While smoke doesn't afford the only source of supply for the building of fogs, it is a great accelerator, as is evidenced by conditions in London or Pittsburgh.

"Now fog has two bad effects on health," says Doctor Holman. "First, it prevents the air of our cities from becoming properly mixed with the fresh outside air; and second, it holds irritating gases, which also come from the burning coal, within the breathing zone, and it makes the temperature higher in summer by interfering with the radiation of heat from our streets and buildings, and lower in winter by cutting off the sun's rays. All these conditions have very marked effects on health. Breathing impure air lowers our general resistance, and the irritating gases, by directly acting on the air passages, make more easy the entrance of bacteria. Acute infections of the nose, throat and lungs are more common in smoky cities than elsewhere and increase during periods of foggy weather.

"The second bad effect of fog comes from interference with the sun's rays. Sunlight is our best and most constant germicide. Smoke clouds and fogs allow only the red rays to pass through, as you see it in the familiar red sun. They prevent the passage of the blue and violet rays, and it is these rays that are most active in destroying bacteria. Thus we magnify the chances of infection by lowering our resistance through the breathing of impure and irritating air, and then we interfere with the natural disinfecting action of the sunlight."

⁂

B. Coli in Pasteurized Milk.—The fact that the presence of bacillus coli or any other non-sporulating gas producer in pasteurized milk has usually been taken to indicate improper pasteurization or subsequent contamination of the milk, led Dr. L. P. Shippen to make tests upon the thermal death point of 31 strains of these organisms which had been recovered from pasteurized milk and 13 strains recovered from unpasteurized milk. From his careful experiments conducted at the Laboratory of Bacteriology and Hygiene at Johns Hopkins University the author draws the following conclusions: (1) as observed by DeGralf and De Jong certain strains of B. coli are not killed by a temperature exceeding that commonly used in pasteurization. (2) the thermal death point of these and similar organisms is not a constant quantity but varies in the different strains of the same bacterium. In the case of B. coli communior this variation was found to be as great as 13 degrees. (3) The presence of B. coli in pasteurized milk cannot be taken as an index of its improper pasteurization for subsequent contamination.—*Journal of the American Medical Association*, May 17, 1915.

Industrial Hygiene and Sanitation.

Industrial Disease Compensation.—The following opinion of the Massachusetts Supreme Court, published in *Public Health Report* for May 14, 1915, is of noteworthy significance:

In re Brightman. In re Aetna Life Insurance Co. 107 N. E. Rep., 527. Dec. 31, 1914.

"Deceased was employed as a cook on a lighter. He suffered from heart disease, which, aggravated by excitement when the lighter sank and by his exertions in saving his personal effects, caused his death. The court held that his death was caused by an injury within the meaning of the Massachusetts workmen's compensation act.

"Rugg, C. J.: * * *

* * * * *

"The deceased employee was a cook upon a lighter, where his employment required him to live and be a large part of the time. The craft began to sink and he then made several trips to and from the deck in an attempt to save some of his clothes and a surveying instrument. With these he hastened to the dock, where he died soon after. He had suffered from valvular disease of the heart, and his exertions in the effort to save his belongings and the excitement incident to the loss of the vessel so aggravated the heart weakness as to cause his death. The perils of the sea were risks arising out of and in the course of the employment of the deceased. The sinking of the boat obviously was one of these perils. It is impossible to say as matter of law that it is not one of the instincts of our common humanity to try to save from a sinking vessel all of one's possessions that reasonably can be secured. The deceased perhaps exerted himself too much for this purpose, although it would be difficult on the evidence to determine to how great an extent the fatal result was due to that cause rather than to the excitement of the occasion. Under these circumstances the calm and wisdom of quiet and safety cannot be expected. Much must be excused to the surrounding commotion. The deceased did not abandon the service of his employer and embark on a venture of his own when he tried to save his clothing. It was an implied term of such service as this that the employee might use reasonable effort to this end in an exigency like that which arose. This is not an instance where the discipline of a ship was violated or a higher duty neglected. It was in the course of his employment to live upon the lighter. Whatever it was reasonable for anyone to do leaving a sinking vessel, which was his temporary home, was within the scope of his employment. The standard to be applied is not that which now, in the light of all that has happened, is seen to have been directly within the line of labor helpful to the master, but that which the ordinary man required to act in such an emergency might do while actuated with a purpose to do his duty.

"The cases relied upon by the insurer, collected in 25 H. L. R. 420, 421, are distinguishable. They are all instances of conduct by the employee quite outside the scope of the employment, resting upon intelligent abandonment for the moment of duty to the employer. In the case at bar there may be found to be apparent to the rational mind a causal connection between the employment and the thing done by the employee at the time of the sinking of the lighter. McNichol's Case, 215 Mass. 497, 102 N. E., 697.

"Acceleration of previously existing heart disease to a mortal end sooner than otherwise it would have come is an injury within the meaning of the Workmen's Compensation Act. *Wiemert* v. *Boston Elev. Ry.* 216 Mass., 598, 104 N. E., 360; *Clover Clayton & Co.* (*Ltd.*) v. *Hughes* [1910], A. C. 242. The inference that the death of the employee arose out of and in the course of his employment was warranted by the evidence."

*

Safety First in Treating Hand Infections.—The treatment of hand infections, in order to give the best results, must include:

1. Proper preventive measures, especially the prophylactic use of tincture of iodine and the early reporting of all minor injuries.

2. The treatment of all hand infections as a serious surgical condition from their inception and the adoption of radical hospital treatment early.

3. The proper and early diagnosis of the type and nature of infection and the exact location of the pus.

4. A proper incision of the abscess, in order to establish adequate drainage and yet not spread the infection to other spaces.

In talking with a number of surgeons and managers of claim departments in large companies, they all agree that:

Hand infections cause a high percentage of their disability.

Over 50 per cent. of their hand deformities are the result of infected injuries.

A great many amputations result from neglected infected fingers.

Hand infections are usually the result of minor injuries, such as pin pricks, nail wounds, splinters, scratches, small cuts, cracked hands, blisters, contusions and abrasions. Such minor cases, as a rule, do not report to the doctor until the infection has developed.

Severe hand injuries, such as extensive lacerations or severe crushing injuries, are seldom infected. The nature of these injuries is such that the patients are forced to consult the doctor at once.

The early treatment of all accidents, no matter how slight, would reduce infections to a marked degree.

First Aid Treatment.

"First aid" should be given in a majority of cases by a physician who is especially trained in dressing a fresh injury so as to prevent further complications and to give the quickest recovery possible.

The next best "first aid" worker is a well-trained surgical nurse, but even then the injured employee should be sent to the doctor as early as possible. The chief point to be emphasized here is the early reporting for this first surgical dressing.

In the absence of a doctor or a nurse, a trusted employee should be furnished with a simple emergency kit and given careful instructions in its use.

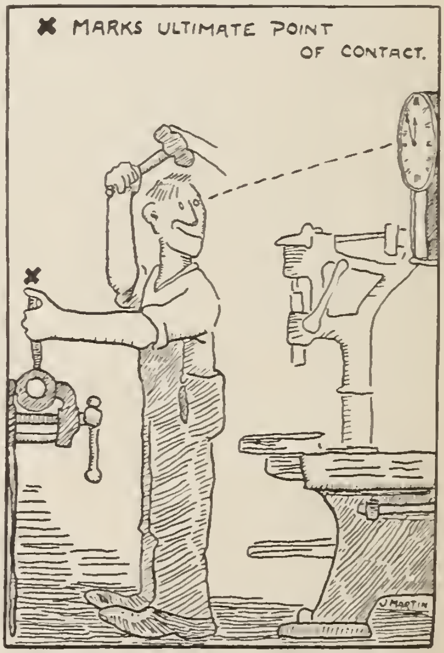
The emergency man should be positively warned against washing a fresh wound with soap and water or with any antiseptic, especially hydrogen peroxide. This washing of a wound usually rubs the dirt and germs deeper into the tissues and makes the infections more prone to occur. Hydrogen peroxide, by its foaming expansive power, likewise carries dirt deeper into the wound without killing the germs of infection.

Iodine is the best emergency antiseptic.

It would be a great saving to any industry to absolutely forbid fellow employees from rendering "first aid" to one another, especially in the minor accidents. The extraction of splinters from hands or other parts of the body, removal of foreign particles from the eye, especially emery, and the care of small cuts, nail wounds, etc., by fellow employees, is a very common practice. These kindly efforts are so frequently followed by serious complications necessitating prolonged disability, that it would be much safer and cheaper to send all such minor accident cases to a physician for proper first care, and usually one or two dressings would be necessary, with practically no loss of time from work.

Safety First for the Injured.

Prevention of infection is one of the most fertile fields of endeavor open to the company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✖
J MARTIN

MOST ACCIDENTS RESULT FROM BONEHEADED CARELESSNESS surgeon. It is the safety first movement for the injured. A study of the etiology of every infection will show the majority are due to preventable minor accidents, and by a removal of these causes a great reduction in infections will ensue. Thus, in one large concern, the tin lining of bins which had become loosened, was the cause of injuries which became infected. In every case a notice was sent to the manager, pointing out the preventable nature of this accident, and in one year the injuries from this source were reduced from 75 to 10. The same procedure was followed in the case of broken baskets, exposed ends of wire, nails on the floor, pins in packages, etc., all resulting in a decrease in minor accidents and therefore in infections.

The use of gloves or other protection to the hands is of great value in certain occupations tending to blister or to crack the hands.—*Wells, Fargo Messenger*—Reprinted from the *Manufacturers' News.*

❋

Principles and Methods of Industrial Control.—An industry is responsible for the conditions existing in its establishments.

It is the duty of an industry to take care of and to improve the sanitary conditions of its factories and workshops.

Good sanitary conditions of industrial establishments are a debt which the manufacturers in an industry owe to the public and to the workers.

Efficient and permanent improvement of industrial conditions can be brought about only by industrial self control, by a coöperation of manufacturers, workers and the consumer.

Humane and decent industrial conditions mean good sanitary conditions of the shops, living wages and hours of labor that do not cause over-fatigue.

No detection of sanitary crimes, but prevention.

No threats, fines or penalties, but friendly counsel, agitation and education.—*Bulletin of the Joint Board of Sanitary Control*, New York City.

❋

Motion Pictures in Fire Safety Work.—An article by J. E. Latta in the May number of *Safety Engineering* tells of a new and valuable use for the "movies." A series of films have been prepared in the Underwriters Laboratories in Chicago, showing in detail many of the experiments made there with the object of preventing fires. The observer is carried in the pictures to every important part of the big Chicago testing station. The pictures are noteworthy because of their completeness—and should be of service in campaigns for building code reforms, fire prevention and the like. They are filed in the office of the secretary of the National Fire Protection Association and at the Stubbs Lecture Bureau in Chicago.

❋

Headache—Enemy of Efficiency.—Headache as an enemy of health and efficiency is admirably treated in a recent number of "For You"—the Ford Health Bulletin.

The wisdom and the value of the following advice to employees is apparent at first reading—and this relatively new departure is to be commended.

"During the first three weeks of March there were 544 cases of headaches reported to the Hospital. Possibly there were as many more not reported. The point is, that people suffering from headache are not as efficient as others.

"Lots of men and women think—'Oh, it's just a headache. It will pass.' Then they let it go at that and continue to suffer. Of course they will pass. So will typhoid fever or any other disease.

"The thing for you to do is to get good advice from the doctor about what is causing your headaches. Then go after the remedy. Don't have any guess work about it. Any headache is important enough to be the subject of special study and advice. The treatment that will cure somebody else's headache probably will not do you any good. Maybe you need something entirely different. Be sure you get the right advice and then follow it.

"Some headaches result from heart or nerve strains. The blood gets choked up inside the head and can't get out fast enough. Most headaches come from improper foods, drinks and eating too rapidly. Still others come from poor eyesight.

"Don't expect 'dope' to cure your headache. Nine-tenths of the patent medicines and powders you see advertised contain powerful drugs, and if you use them, you are taking a chance of getting the 'dope' habit. *Do you want to be a drug fiend?* Then get advice from the doctor and do as he says."

⁂

The Medical Report of an Industrial Plant.—The Colorado Fuel and Iron Company has just issued an interesting and completely illustrated report from the Medical Sociological Departments. The medical report shows a total of 94,810 cases treated during 1914 as compared with 101,375 cases treated during 1913. The sick and injured at the mines are sent to the Company's hospital. There are one-tenth as many cases of erysipelas, and one-fourth as many cases of typhoid fever among employees as ten years ago. All employees are vaccinated against smallpox and many against typhoid fever. They are requested to undergo frequent physical examinations and are given practical instructions as to how they may avoid accidents. Twenty thousand dollars has been spent in safety work mostly during the last three years in equipping the plant and machinery with proper railings and guards. A pamphlet dealing with some phase of personal hygiene of prevention of disease is sent out to workmen each month. The report gives a good outline of the actual operation of this sort of a department in an industrial plant. The record was prepared by Dr. R. W. Corwin, Chief Surgeon, Pueblo, Colo.

⁂

The Results of Scientific Ventilation.—The new Federal Building for the Bureau of Engraving and Printing has recently established a highly scientific and efficient ventilating system which, according to Doctor Laveson, the medical officer, has resulted in an improvement of the quality and quantity of the printing and a marked impression in the health and vigor of the employees. In 1913 two thousand employees applied for treatment of headache. Since moving into the new building there have been one-half as many cases.—*The New York Medical Journal*, May 8.

Personal Notes.

Dr. Allen W. Freeman, Richmond, Va., has resigned as assistant state health commissioner to become epidemiologist for the U. S. Public Health Service at Washington.

⁂

Mr. Charles Saville, late of the firm of Messrs. Hering and Gregory of New York City, has recently been elected Director of Sanitation to the new Board of Health of Dallas, Texas.

⁂

New Health Commissioner at Chicago.—Dr. J. D. Robertson is now health commissioner of the City of Chicago, displacing former commissioner G. B. Young, whose excellent work is known throughout the country.

⁂

The following were elected to membership in the American Public Health Association on May 17, 1915:

Mrs. Elizabeth M. Finnigan, Lyons, N. Y.
Morris Maslon, M. D., Glen Falls, N. Y.
Murray Bartlett, M. D., Manila, P. I.
Paul Louis Feiss, Cleveland, Ohio.
Frank Bachmann, Bacteriologist, Chicago, Ill.
Paul Bellows Brooks, M. D., Norwich, N. Y.
Daniel Warren Poor, M. D., Orange, N. J.
Edward, Mayo Tolman, Hagerstown, Md.
Edward Jenner Wood, M. D., Wilmington, N. C.
Mrs. Clara C. Gunn, Watertown, Mass.
Leonora H. Christian, Minneapolis, Minn.
David H. Bergey, M. D., Philadelphia, Pa.
Gustave R. Tuska, New York.
Margaret Barclay Wilson, New York.
Samuel Archer Munford, Ithaca, N. Y.
Lunsford, D. Fricks, Surgeon, Victor, Montana.
John T. Booth, M. D., Richmond, Va.
Dr. Wm. F. Lippett, San Juan, P. R.
Boney W. Page, M. D., Lumbertown, N. C.
State Board of Health, Lansing, Mich.
S. Josephine Baker, M. D., New York.
Harold Gilbert McGee, West Lansing, Mich.
Chas. Wm. Naulty, Jr., M. D., Perth Amboy, N. J.
Aime Cousineau, Montreal, Canada.

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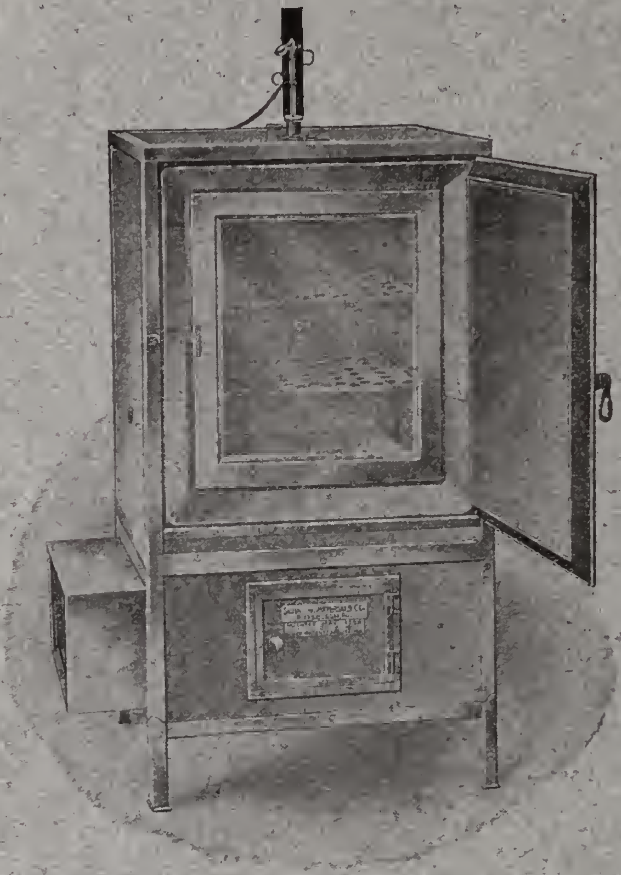

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Manuscripts must be paragraphed and punctuated for submission as "copy" to printer.

Each Manuscript must bear some identifying mark or pen-name, but not the name of the author.

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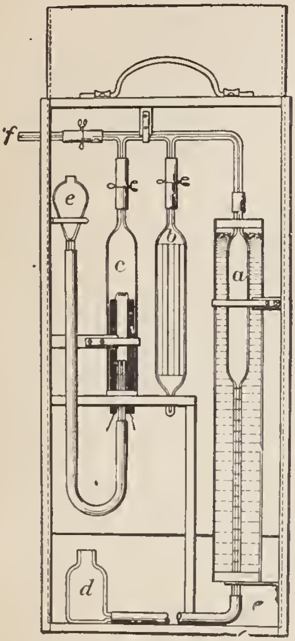

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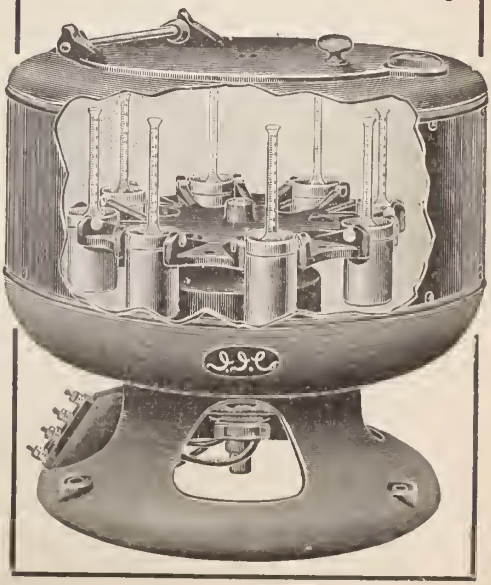
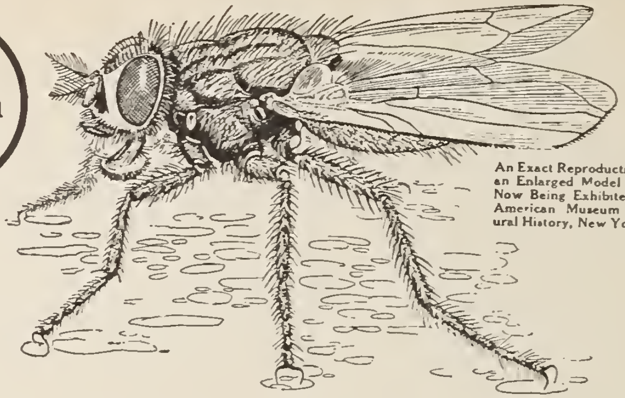


The War on Flies



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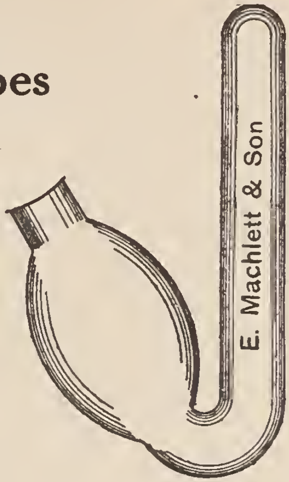

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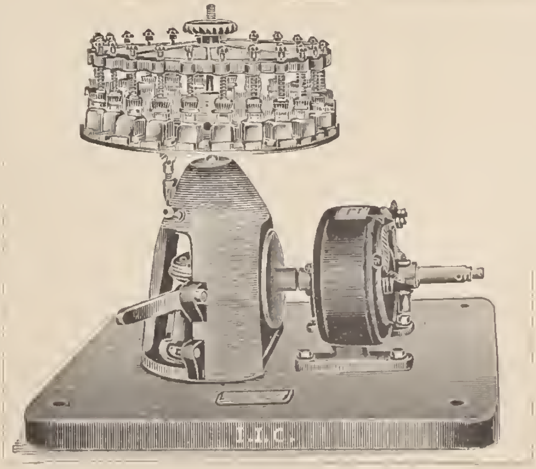

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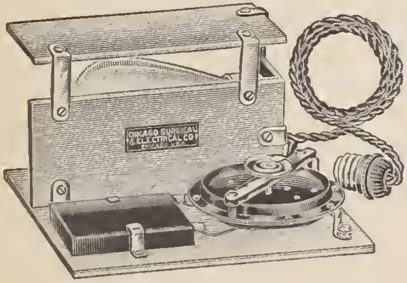

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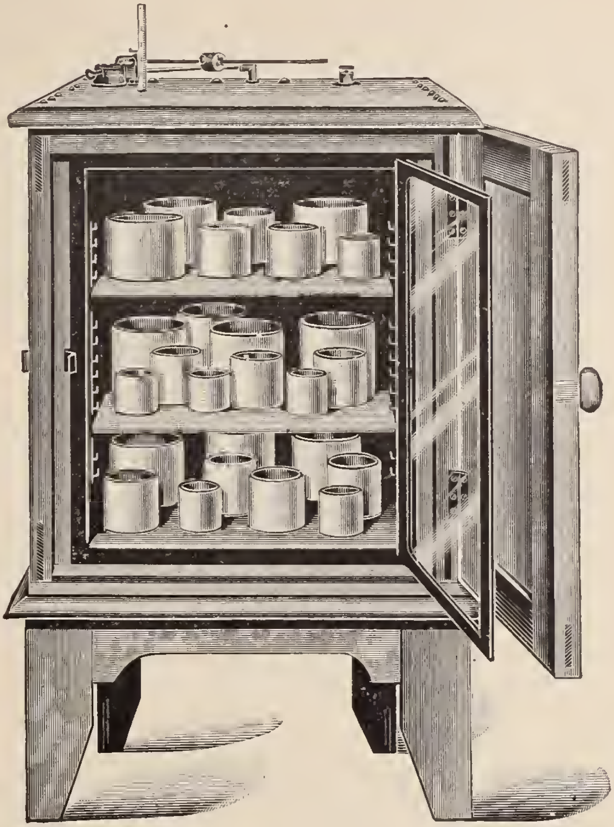

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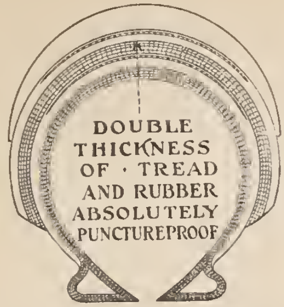

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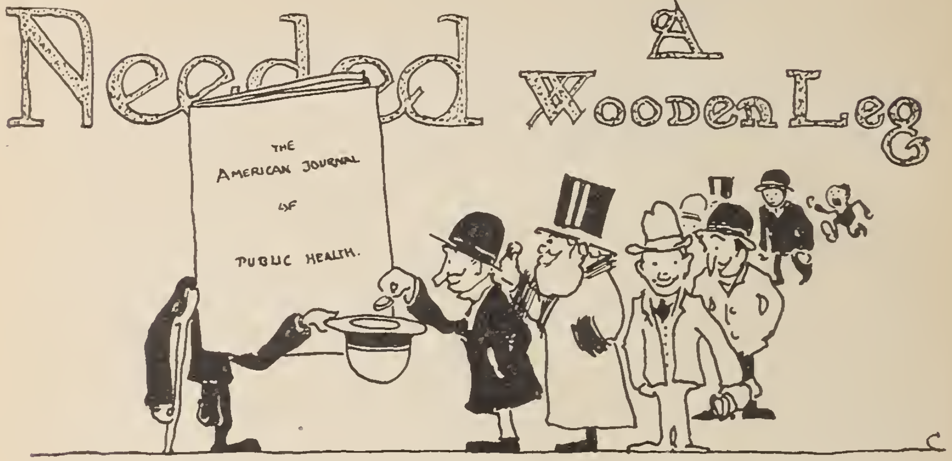
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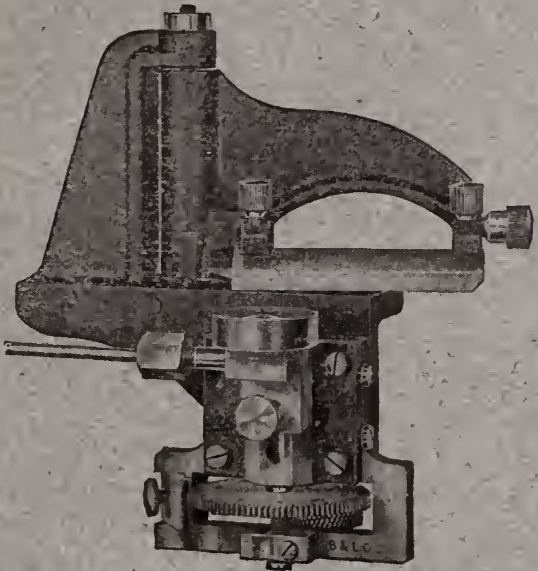

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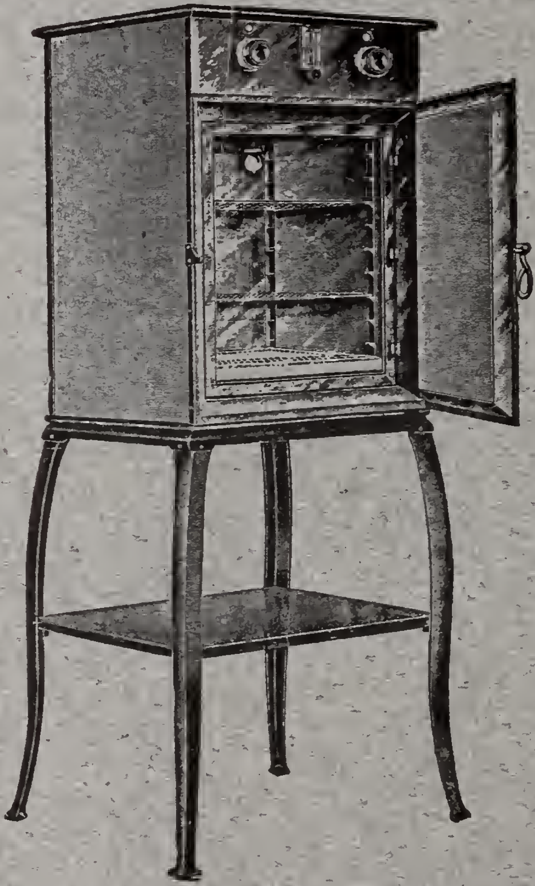

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